# OAK VALLEY OUTLOT

# 2665 OAK VALLEY DRIVE PITTSFIELD TOWNSHIP, WASHTENAW COUNTY, MICHIGAN PRELIMINARY SITE PLAN

### OWNER/APPLICANT

OAK VALLEY MANAGEMENT CO. 6735 TELEGRAPH ROAD, SUITE 110 BLOOMFIELD HILLS, MI 48301 CONTACT: FRED GOLDBERG

# ENGINEER/SURVEYOR/LANDSCAPE ARCH.

3815 PLAZA DR.
ANN ARBOR, MI 48108
CONTACT: KATE BOND
734-995-0200

ARCHITECT

# ROGVOY ARCHITECTS

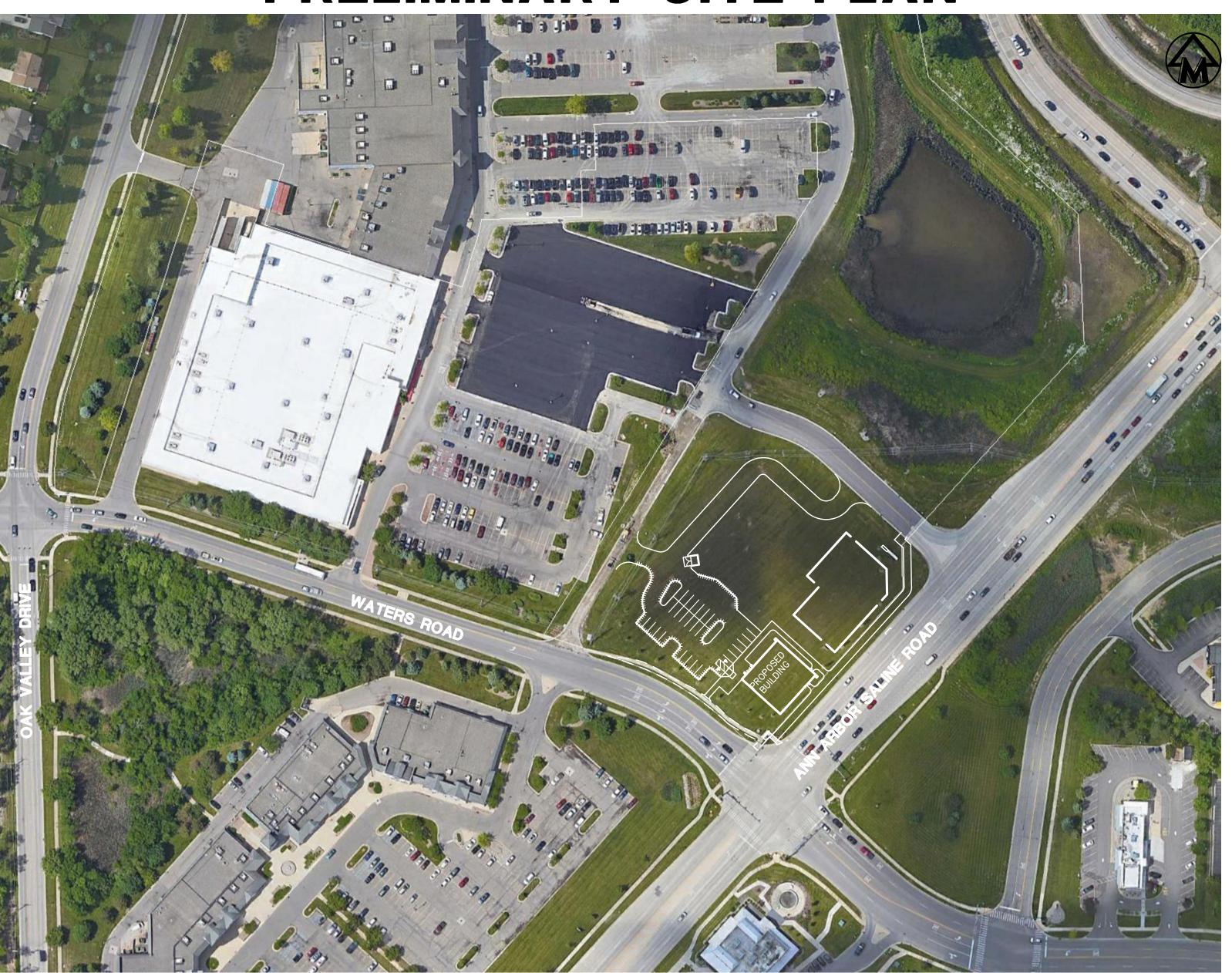
20700 CIVIC CENTER DRIVE, SUITE 170 SOUTHFIELD, MI 48076 KRISTEN LARK 248-540-7700 EXT. 237

Building - Assumes Building Form A, Building Use3

### SITE DATA

		Allowed/ Required		
		Ann Arbor - Saline Road and Waters Road	Pro	posed
		Form-Based Zoning Code		•
Oak Valley Centre Overall Parcel				
Site Area (gross)			1,404,798	sf
			32.25	Acres
minus access easements/ROW/street				
easements				sf
minus wetland/bodies of water			-20,014	sf
AA-Saline Road ROW			14,999	sf
			1,399,783	sf total net
Site Area (net)			32.13	acres
Outlot Only				
			98,975	
Site area (gross)		(Assumes Back of Curb access drives to ROW of Waters/AA Saline Road)	30,373	sf
minus access easements/ROW/street				
easements			2,753	
AA-Saline Road ROW			14,999	
			· · · · · · · · · · · · · · · · · · ·	sf total net
			2.68	acres
Zoning		Current Zoning: Form-Based	Form-Bas	ed Proposed
		Carrelle Estimig. Form Basea		
Form Based Code			T	
Ann Arbor Saline Road				
Street Type	Urban	Ann Arbor Saline		
Site Type	A	Small sites/out-lot additional lot site		
	A	Permitted - min. 1 & max. 3 story, general single-purpose buildings.		
	В	Conditional - min. 2 & max. 3 story , multi-tenant		
Building Form	С	Conditional - min. 2 & max. 3 story, typically residential	Type A propose	ed
Ü	D	Not Applicable - min. 2 & max. 4 story, residential on top of retails	'' ' '	
	E	Not Applicable - Varies between rear and front building; 1 - 4 stories,		
		multi-retail and entertainments		
	1	Not Applicable - Residential Uses		
	2	Permitted - Residential / Lodging uses		
	3	Permitted - Office / Institutional	T 2 D	<b>.</b> 1
Use Groups	4	Conditional - Automobile / Transportation Uses	Type 3 Propose	u
	5	Permitted - Retail, Entertainment, and Service Uses		
	6	Not Applicable - Miscellaneous Commercial Uses		
	7	Not Applicable - Industiral Uses		
Waters Road				
Street Type	Suburban	Waters Road		
Site type	D	Outlot parcel		
Site type	A	Permitted - min. 1 & max. 3 story, general single-purpose buildings.		
	В	Permitted - min. 2 & max. 3 story, general single-purpose buildings.		
	C	Conditional - min. 2 & max. 3 story, typically residential		
Building Form	D	Permitted - min. 2 & max. 4 story, residential on top of retails	Type A propose	ed
	E	Not Applicable - Varies between rear and front building; 1 - 4 stories,		
		multi-retail and entertainments		
	1	Not Applicable - Residential Uses		
	2	Permitted - Residential / Lodging uses		
	3	Permitted - Office / Institutional		
Use Groups	4	Conditional - Automobile / Transportation Uses	Type 3 Propose	d
OSC Groups	5	Permitted - Retail, Entertainment, and Service Uses	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	-
	6	Not Applicable - Miscellaneous Commercial Uses		
	7	Not Applicable - Industrial Uses		
		Trockipphousic industrial oscs	L	

Proposed Use			Financia	l Institution	
Floor Area	NA		5,005	sf	
Maximum Height	1 story, 14 ft	minimum	1 sto	1 story, 22 ft	
	3 story, 38 ft	3 story, 38 ft maximum			
Setbacks					
Front	10ft setback,	75% building façade minimum	TBD	ft	
Side	none, 5 ft mi	nimum if provided	NA	ft	
Rear	10 ft minimu	m setback	945	ft	
Parking	side or rear y	vard, screening from ROW if in side yard	F	Rear	
Pedestrian access	required from	m ROW and cross access in outlot	Pro	vided	
Impervious Surface			•		
Outlot - Building Type A	80% maximu	m	30,606 sf	26.2%	
Oak Valley Centre Overall - Building Type E	90% maximu	90% maximum		61.1%	
	·				
Vehicular Parking					
Design standards	9.5ft x 20ft w	rith 22ft aisle - 90 degree			
Required Parking	1 per	200sf plus 1 per 2 non-drive ATMS - financial institution			
		5,005sf/200sf = 25 Spaces required	32 Spaces Provi	ided	
		*Building does not provide non-drive ATMs.			
Loading Spaces	•	•			
Design standards	10ft x 55ft wi	th 15ft height clearnance			
Commercial/Office	1 for first 5,000sf, additional for between 5,001 and 60,000sf - 1 per 20,000sf				
	5,005 / 5000 =	= 1 Space required.	1 Provided	1 Provided	
Bicycle Parking			'		
	All sites with	10+ parking spaces requires to have minimum 1 bike rack and			
Required Bike rack		accommodate 2 space			



# SCALE : NTS

### **LEGAL DESCRIPTION**

Ground Lease Parcel 1

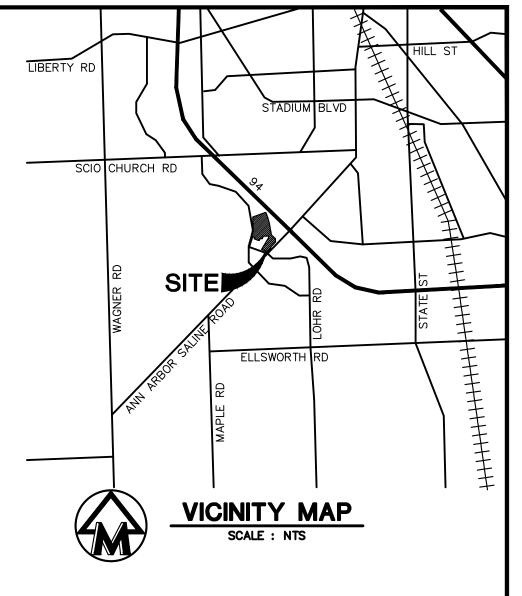
Commencing at the South 1/4 corner of Section 6, Town 3 South, Range 6 East, Pittsfield Township, Washtenaw County, Michigan; Thence North 89 deg. 19' 30" East, 208.97 feet along the South line of said Section 6 for a Place of Beginning; Thence North 32 deg. 04' 00" East, 498.80 feet; Thence North 01 deg. 23' 50" West 95.10 feet; Thence South 88 deg. 36' 10" West, 301.00 feet; Thence South 01 deg. 23' 50" East, 62.00 feet; Thence South 88 deg. 36' 10" West, 20.00 feet; Thence South 01 deg. 23' 5011 East, 62.00 feet; Thence South 88 deg. 36' 10" West, 136.66 feet; Thence 26.26 feet along the arc of a 140.00 foot radius non-tangential circular curve to the right, chord bearing South 12 deg. 47' 55" West, 26.22 feet; Thence South 18 deg. 10' 20" West, 68.66 feet; Thence North 71 deg. 49' 4011 West, 35.00 feet; Thence South 18 deg. 10' 20" West, 10.00 feet; Thence North 71 deg. 49' 40" West, 123.04 feet; Thence North 18 deg. 10' 20" East, 8.00 feet; Thence North 71 deg.49' 40" West, 122.44 feet; Thence North 18 deg. 10' 20" East, 85.69 feet; Thence North 71 deg. 49' 4011 West, 107.56 feet; Thence South 18 deg. 10' 20" West, 506.26 feet; Thence along the Northerly Right of Way line of Waters Road (66 feet wide) 53.86 feet along the arc of a 633.00 foot radius non-tangential circular curve to the left, chord bearing North 85 deg. 11' 33" West, 53.84 feet; Thence along the Easterly Right of Way line of Oak Valley Drive (86 feet wide) the following 5 courses: North 01 deg. 04' 40" West 6.26 feet, 153.54 feet along the arc of a 457.00 foot radius circular curve to the right, chord bearing North 08 deg. 32' 50" East, 152.82 feet, North 18 deg. 10' 20" East, 542.34 feet, 287.93 feet along the arc of an 843.00 foot radius circular curve to the left, chord bearing North 08 deg. 23' 15" East, 286.53 feet and North 01 deg. 23' 50" West, 541.70 feet; Thence North 69 deg. 59' 26" East, 708.84 feet; Thence along the Southwesterly Right of Way line of Interstate - 94 Expressway (variable width) along the following 9 Courses: South 40 deg. 34' 53" East, 39.01 feet, South 20 deg. 00' 34" East, 254.93 feet, South 15 deg. 38' 50" East, 314.96 feet, South 09 deg. 41' 15" East,

621.59 feet, South 47 deg. 18' 05" East, 274.31 feet, South 02 deg. 18' 05" East, 176.78 feet, South 42 deg. 41' 55" West, 367.27 feet, South 00 deg. 40' 30" East, 58.97 feet and South 42 deg. 33' 53" West, 293.57 feet; Thence along the Northerly Right of Way line of Waters Road (66 feet wide) the following 3 courses: North 47 deg. 26' 07" West,64.52 feet, 153.85 feet along the arc of a 366.00 foot radius circular curve to the left, chord bearing North 59 deg. 28' 39" West, 152.72 feet, and North 71 deg. 31' 10" West, 115.92 feet; Thence North 32 deg. 04' 00" East, 211.12 feet to the Place of Beginning.

### LESS AND EXCEPT THE FOLLOWING:

Commencing at the South 1/4 corner of Section 6, Town 3 South, Range 6 East, Pittsfield Township, Washtenaw County, Michigan; Thence North 89 deg. 19' 30" East, 645.45 feet along the South line of said Section 6 and the centerline of Waters Road, as originally established; Thence along the Southwesterly line of Interstate-94 Expressway the following 7 courses: North 42 deg. 41' 55" East, 276.38 feet, North 02 deg. 18' 05" West, 176.78 feet, North 47 deg. 18' 05" West, 274.31 feet, North 09 deg. 41' 15" West, 621.59 feet, North 15 deg. 38' 50" West, 314.96 feet, North 20 deg. 00' 34" West, 254.93 feet and North 40 deg. 34' 53" West, 39.01 feet; Thence South 69 deg. 59' 26" West, 225.48 feet; Thence South 20 deg. 00' 34" East, 36.00 feet for a Place of Beginning; Thence North 69 deg. 59' 26" East, 90.00 feet; Thence South 20 deg. 00' 34" East, 114.00 feet; Thence South 69 deg. 59' 26" West, 90.00 feet; Thence North 20 deg. 00' 34" West, 114.00 feet to the Place of Beginning.

Together with the non-exclusive easements, being more fully described in Operating and Easement Agreement at Recording No. Liber 2367, Page 571, and Amendment thereto at Recording No. Liber 2375, Page 244.



### SHEET INDEX

- # SHEET TITLE
- COVER SHEET
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- O6 STORMWATER MANAGEMENT PLAN
- 07 FIRE PROTECTION PLAN
- 08 LANDSCAPE PLAN
- 09 LANDSCAPE DETAILS
- 10 SITE DETAILS
- 44 04447404 0544
- 11 SANITARY SEWER DETAILS
- 2 SANITARY SEWER SPECIFICATIONS
- STORM SEWER DETAILS AND SPECIFICATIONS
- 4 WATER MAIN DETAILS
- 15 WATER MAIN SPECIFCATIONS
- 16 SOIL EROSION DETAILS AND NOTES
- 7 EARTHWORK SPECIFICATIONS
- 18 PHOTOMETRIC PLAN
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- A-1 BUILDING ELEVATIONS AND FLOOR PLANS

### PROJECT NARRATIVE

THE APPLICANT PROPOSES ONE NEW OFFICE / INSTITUTIONAL BUILDING ON THE APPROXIMATELY 2.2 ACRE OUTLOT AT ANN ARBOR SALINE AND WATERS ROAD. THE TENANT SPACES WILL BE SERVED BY ON—SITE PARKING WITH TWO ACCESS DRIVEWAYS. THE INFRASTRUCTURE HAS BEEN DESIGNED TO SERVE ONE ADDITIONAL BUILDING IN A FUTURE PHASE.

THE SITE IS SERVED BY AN UNDERGROUND STORMWATER MANAGEMENT SYSTEM THAT OUTLETS TO THE EXISTING WETLAND LOCATED TO THE NORTHEAST. NATURAL FEATURES ON THE SITE ARE NEGLIGIBLE AND THE EXISTING TREES THAT ARE LOCATED ON THE SITE ARE PROPOSED TO BE TRANSPLANTED TO ALLOW FOR THE NECESSARY EARTHWORK THAT IS PROPOSED.

OAK VA	<u>LLE'</u>	Y OUTL	<u> -OT</u>		
DB No. <b>22095</b>		DATE: 12/13/22			
		SHEET 01 OF 20			
EVISIONS: DWNSHIP REVIEW	REV. DATE 04/18/23	CADD: CTS			
JNICIPAL REVIEW	06/15/23	ENG: TPH			
		PM: KEB TECH:			
		PRELIM/22095CV1			
		FB:			
MIDWESTERN  CONSULTING  3815 Plaza Drive Ann Arbor, Michigan 48108 (734) 995-0200 • www.midwesternconsulting.com  Land Development • Land Survey • Institutional • Municipal Wireless Communications • Transportation • Landfill Services					
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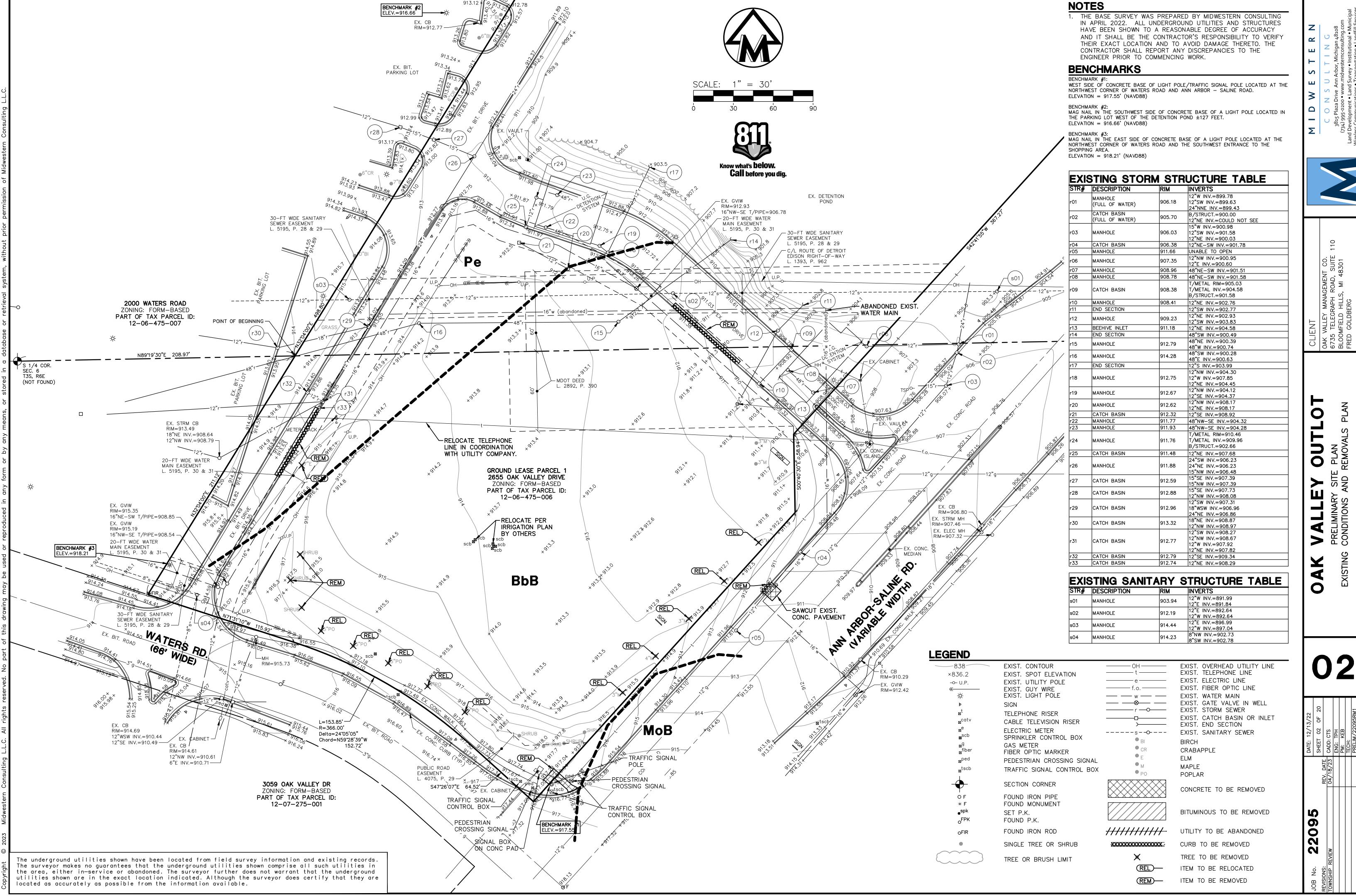
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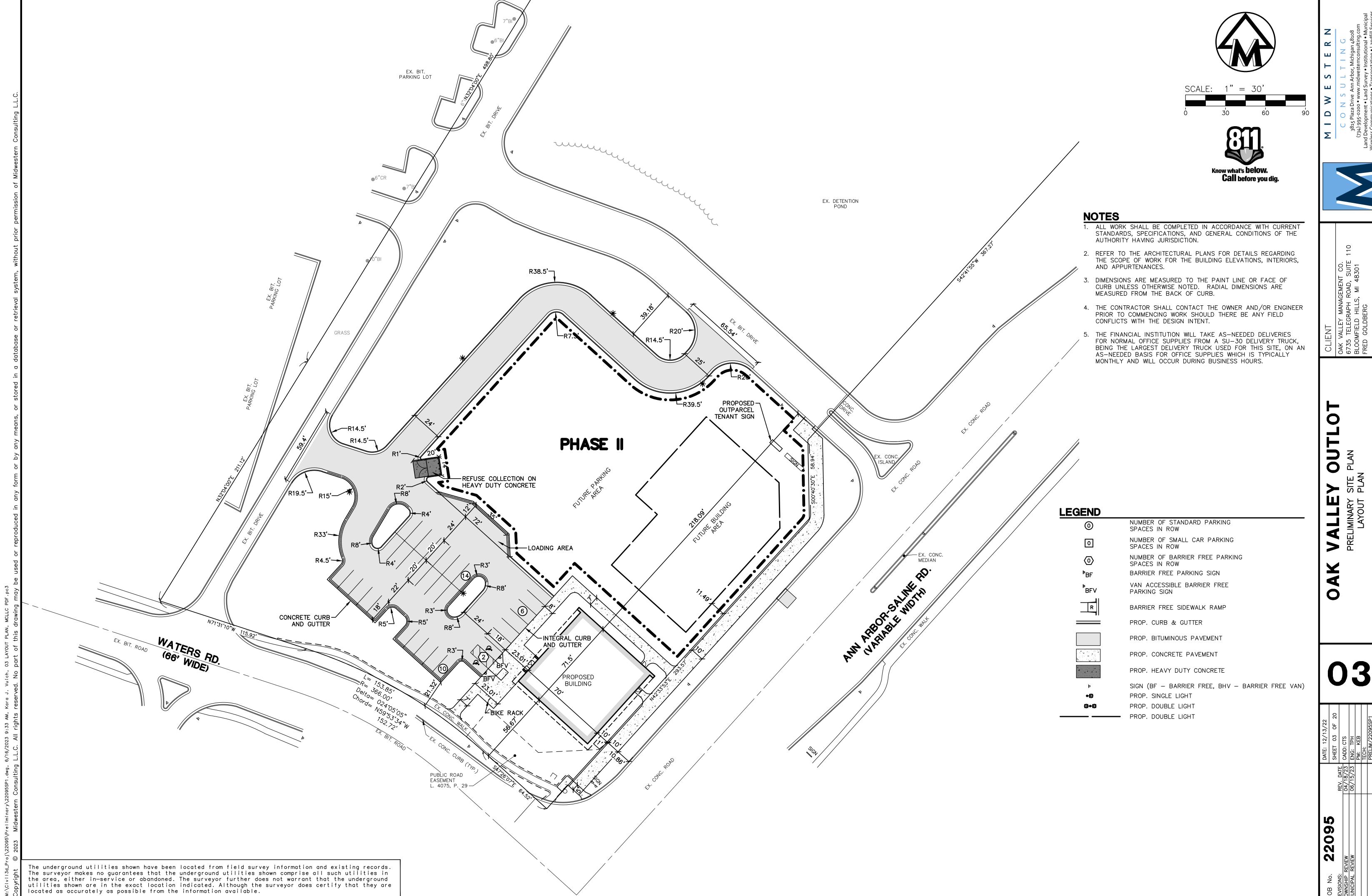
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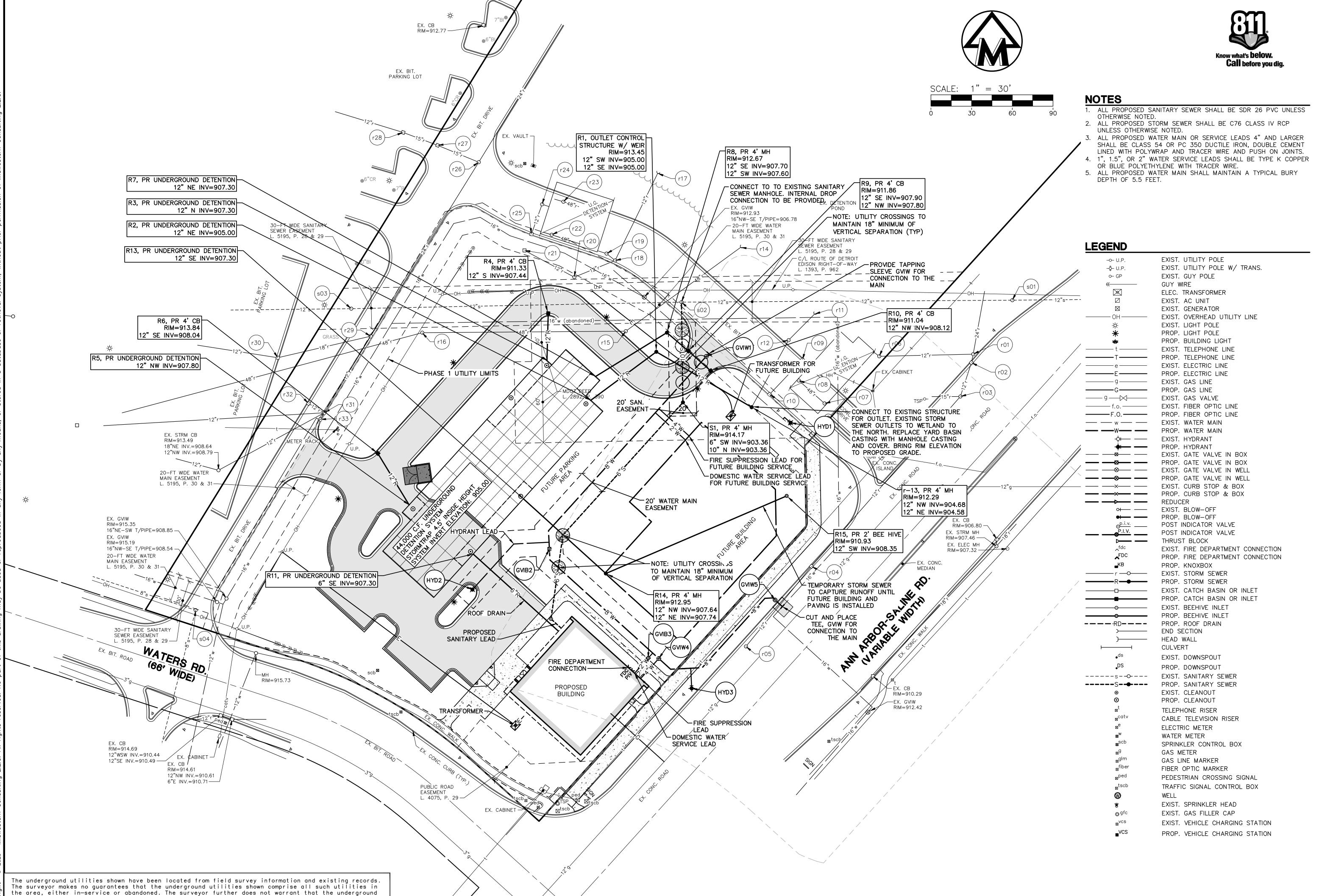
ADAM J
LALIK
ENGINEER
No.
6201309288

P.E. #

OAK VALLEY OUTLOT C.S.P.A. 22-45





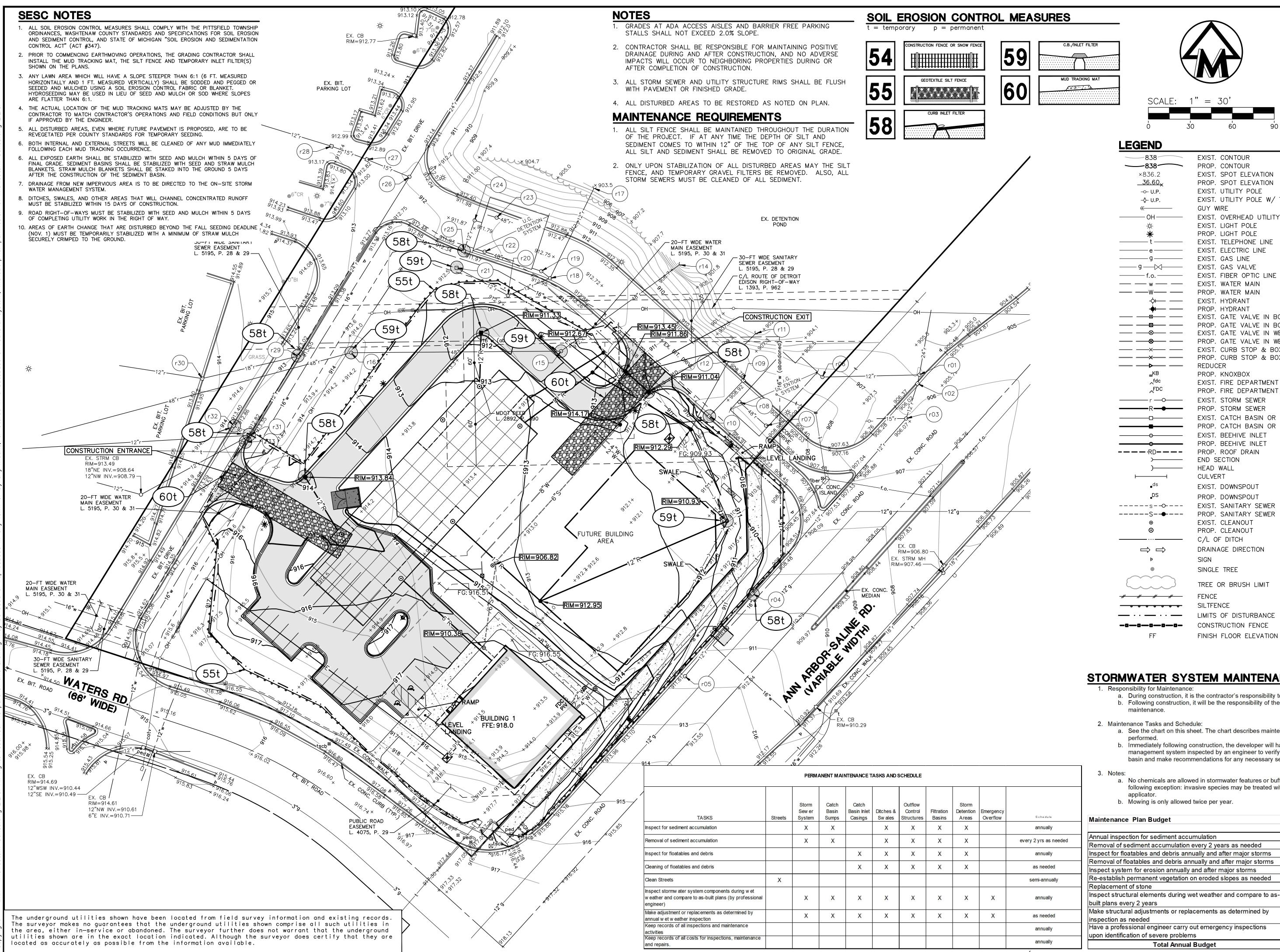


utilities shown are in the exact location indicated. Although the surveyor does certify that they are

located as accurately as possible from the information available.

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EXIST. CONTOUR PROP. CONTOUR EXIST. SPOT ELEVATION PROP. SPOT ELEVATION EXIST. UTILITY POLE EXIST. UTILITY POLE W/ TRANS. GUY WIRE EXIST. OVERHEAD UTILITY LINE EXIST. LIGHT POLE PROP. LIGHT POLE EXIST. TELEPHONE LINE EXIST. ELECTRIC LINE EXIST. GAS LINE EXIST. GAS VALVE EXIST. FIBER OPTIC LINE EXIST. WATER MAIN PROP. WATER MAIN EXIST. HYDRANT EXIST. GATE VALVE IN BOX PROP. GATE VALVE IN BOX EXIST. GATE VALVE IN WELL PROP. GATE VALVE IN WELL EXIST. CURB STOP & BOX PROP. CURB STOP & BOX REDUCER PROP. KNOXBOX EXIST. FIRE DEPARTMENT CONNECTION PROP. FIRE DEPARTMENT CONNECTION EXIST. STORM SEWER PROP. STORM SEWER EXIST. CATCH BASIN OR INLET PROP. CATCH BASIN OR INLET EXIST. BEEHIVE INLET PROP. BEEHIVE INLET PROP. ROOF DRAIN END SECTION HEAD WALL CULVERT EXIST. DOWNSPOUT PROP. DOWNSPOUT ----s--O--- EXIST. SANITARY SEWER PROP. SANITARY SEWER EXIST. CLEANOUT PROP. CLEANOUT C/L OF DITCH DRAINAGE DIRECTION SIGN SINGLE TREE TREE OR BRUSH LIMIT

STORMWATER SYSTEM MAINTENANCE PLAN

- a. During construction, it is the contractor's responsibility to perform maintenance. b. Following construction, it will be the responsibility of the owner to perform
- a. See the chart on this sheet. The chart describes maintenance tasks to be
- b. Immediately following construction, the developer will have the stormwater management system inspected by an engineer to verify grades of the infiltration basin and make recommendations for any necessary sediment removal.
- a. No chemicals are allowed in stormwater features or buffer zones with the following exception: invasive species may be treated with chemicals by a certified
- b. Mowing is only allowed twice per year.

Maintenance Plan Budget	
Annual inspection for sediment accumulation	\$100.00
Removal of sediment accumulation every 2 years as needed	\$500.00
Inspect for floatables and debris annually and after major storms	\$100.00
Removal of floatables and debris annually and after major storms	\$250.00
Inspect system for erosion annually and after major storms	\$100.00
Re-establish permanent vegetation on eroded slopes as needed	\$350.00
Replacement of stone	\$100.00
Inspect structural elements during wet weather and compare to as-	
built plans every 2 years	\$150.00
Make structural adjustments or replacements as determined by	
inspection as needed	\$400.00
Have a professional engineer carry out emergency inspections	
upon identification of severe problems	\$200.00
Total Annual Budget	\$2,250.00

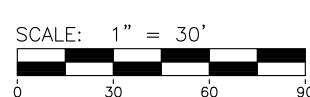
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STORMWATER DETENTION CALCULATIONS

**Call** before you dig.





### **LEGEND**

rO	EXIST. STORM SEWER
——R——	PROP. STORM SEWER
	EXIST. CATCH BASIN OR INLET
	PROP. CATCH BASIN OR INLET
	PROP. ROOF DRAIN
<b>©</b>	EXIST. CLEANOUT
<b>⊙</b>	PROP. CLEANOUT
	PROP. DRAINAGE AREA BOUNDARY
1.17 AC	PROP. DRAINAGE AREA LABEL

### STORM WATER NARRATIVE

THE EXISTING DEVELOPED SITE CONSISTS OF MOSTLY PERVIOUS GRASS SURFACES. STORM WATER RUNOFF SHEETFLOWS AND IS COLLECTED IN SWALES LEADING TO YARD BASINS LOCATED ON THE NORTHEAST SIDE OF THE PARCEL. THESE RELEASE UNDETAINED TO THE WETLAND NORTH OF THE SITE. THE SITE GENERALLY FLOWS FROM SOUTHWEST TO NORTHEAST.

THE PROJECT PROPOSES TO CONSTRUCT A NEW ENCLOSED STORM SEWER CONVEYANCE SYSTEM THAT WILL DIRECT RUNOFF TO A NEW UNDERGROUND DETENTION SYSTEM. THE DETENTION SYSTEM WILL DETAIL THE REQUIRED VOLUME AS CALCULATED PER THE CURRENT STANDARDS OF THE WASHTENAW COUNTY WATER RESOURCES COMMISSIONER'S OFFICE AT THE TIME OF SUBMITTAL, AND SLOWLY RELEASE THE WATER INTO THE EXISTING STRUCTURE WHICH OUTLETS TO THE WETLAND NORTH OF THE SITE AT A CONTROLLED RATE NOT TO EXCEED 0.15 CFS PER ACRE FOR THE SYSTEM'S TRIBUTARY AREA (FOR EVENTS UP TO THE 24-HOUR, 100-YEAR STORM INTENSITY).

ALSO NOTE THAT THE DETENTION SYSTEM IS DESIGNED TO ACCOMMODATE THE ADDED IMPERVIOUSNESS OF A FUTURE 9,400 SF BUILDING IN DA3. THE DETENTION SYSTEM HAS BEEN DESIGNED TO ACCOMMODATE THE INCREASE IN IMPERVIOUSNESS IN THE EVENT OF FUTURE SITE DEVELOPMENT.

THE OUTLET CONTROL STRUCTURE IS TO BE DESIGNED FOR WHAT IS BEING PROPOSED DURING THIS SUBMITTAL. IN FUTURE DEVELOPMENT, THE ORIFICES WILL BE PLUGGED AND REDRILLED FOR THE NEW SITE CONDITIONS.

# **ORIFICE CALCULATIONS**

### C. Two-Stage Outlet Design

First Flush Discharge (24-36 hours for the detention	of first flush storm event)	
Average Head (Have) = 2/3 (Xff - Xbot) =	2/3 (905.45 - 905) =	0.30 ft
First Flush Max. Flowrate (Qff-max) = Vff / 24 hrs =	4453cfs / (24 hrs*3600) =	0.05 cfs
Req Area (Aff) = Qff-max / 0.62 / sqrt(2*g*Have) =	0.05/0.62/(2*32.2*0.3)^0.5=	0.018 sft
Orifice Diameter, Proposed		0.875 in
Orifice Area	=	0.0042 sft
Number Required for 24 hr drainage = Aff / Orifice Area=	0.018 sft / 0.0042 sft =	4.39 holes
Number of Holes to Use		4 holes
Area of (4) - 0.875 inch Orifi Aff		0.0167 sft
Actual Flow (Qff) = 0.62 * Aff * sqrt(2*g*Have) =	0.62 * 0.0167 *sqrt(2*32.2*0.3) =	0.046 cfs
Actual Time (Tff) = Vff / Qff =	4453 cf / 0.046 cfs / 3600 =	27.18 hr
Bankfull Discharge (36-48 hours)		
Average Head (Have) = $\frac{2}{3}$ (Xbf - Xbot) = $\frac{2}{3}$ (905.9)	1 - 905 ) =	0.61 ft
Actual Flow (Qbf) = $0.62 * Aff * sqrt(2*g*Have) =$	•	
Actual Time (Tbf) = Vbf / Qbf =	the second secon	
Drawdown Time for Bankfull Volume is between 36 and		00.10 111
Therefore use (4) 0.875 inch Diamet		
morotote use (4) 0.075 men plumet		
100-year Discharge (0.15 cfs/acre max. allowed)		
Max Head to Lowest Holes (Hmax100-ff) = X100 - Xbot=	908.09 - 905 =	3.09 ft

Therefore use (4) 0.875 inch Diameter Holes	at Elev 905		
100-year Discharge (0.15 cfs/acre max. allowed)			
Max Head to Lowest Holes (Hmax100-ff) = X100 - Xbot=	908.09 - 905 =	3.09 f	t
Max Flow at Lowest Holes (Qmax-ff)= 0.62 * Aff * sqrt(2 * g * Hma	ax) =		
= 0.62 * 0.016	67 * sqrt(2 * 32.2 * 3.09 ) =	0.146	cfs
Max Head to 100yr Holes (H <sub>max-100</sub> ) = X <sub>100</sub> - X <sub>bf</sub> =	908.09 - 905.91 =	2.18 f	t
QA (Allowable 100-year release rate)= 0.15 cfs/acre =	0.15 cfs * 1.92 ac =	0.288	cfs
Max flow through 100-year holes = Qmax-100 = QA - Qmax-ff =	0.288 cfs - 0.146 cfs =	0.141	cfs
Max. Area for Orifices (A <sub>100</sub> ) = Q <sub>max</sub> / 0.62 / sqrt (2*g*h-100 <sub>max</sub> )		0.02	sft
Orifice Diameter		0.750 i	n
Orifice Area		0.0031	sft
Number Required for 0.15 cfs/acre drainage		6.28	
Number of holes used		6 6	ea
Area of (6) - 0.75 inch Orific (A100)		0.0180 s	sft
100-year orifices - Actual Flow (Q <sub>max-100</sub> ) = 0.62 * A <sub>100</sub> * sqrt (2	* g * H <sub>max</sub> 100)		
= 0.62 * 0.018	8 * sqrt (2 * 32.2 * 2.18 ) =	0.130	cfs
Actual Max Release Rate (Qmax) = Qmax-100 + Qmax-ff =	0.13 cfs + 0.146 cfs =	0.28	ofs
100-year Drawdown Time (72-hour max. to the lowest orific	e)		
Average head to first flush holes with all orfice in use (Hff-ave) = 2	?/3 (X100 - Xbf) + (Xbf - Xbot)		
H <sub>ff-ave</sub> = 2/3 (908.09 - 9	05.91) + (905.91 -905) =	2.36 f	t
Average flow through lowest holes to bankfull elevation = 0.62 * A	.ff * sqrt (2 * g * Hff-ave)		
Qff-ave = 0.62 * 0.0167 * SQRT( 2 * 32.2 * 2.36 )		0.128	cfs
Average head to 100-year holes with all orifices in use = $2/3$ (X <sub>100</sub>	)-Xbf)		
H <sub>100-ave</sub> = 2/3 * ( 908.09 - 905.91 ) =		1.45 f	t
Average flow through 100-yr holes with all holes in use = 0.62 * A			
$Q_{100-ave} = 0.62 * 0.018$	8 * sqrt( 2 * 32.2 * 1.45 ) =	0.108	
Combined drawdown flow (Q100-bf) = Qff-ave + Q100-ave =	0.128  cfs + 0.108  cfs =	0.235	cfs
Volume of Storage above Bankfull Elev (Vrem) = V100 - Vbf =	30285 - 8919 =	21,366	cft
Time to drain Volume between 100yr and bankfull elevations = Vr	em/Q100-bf/3600		

Total 100-year drawdown time = T100 = T100-bf + Tbf =

Therefore use (6) 0.75 inch Diameter Holes at Elev 905.91

= 21366 cf / 0.235 cfs / 3600 = 25.20 hr

38.18 hrs + 25.2 hrs = 63.38 hr

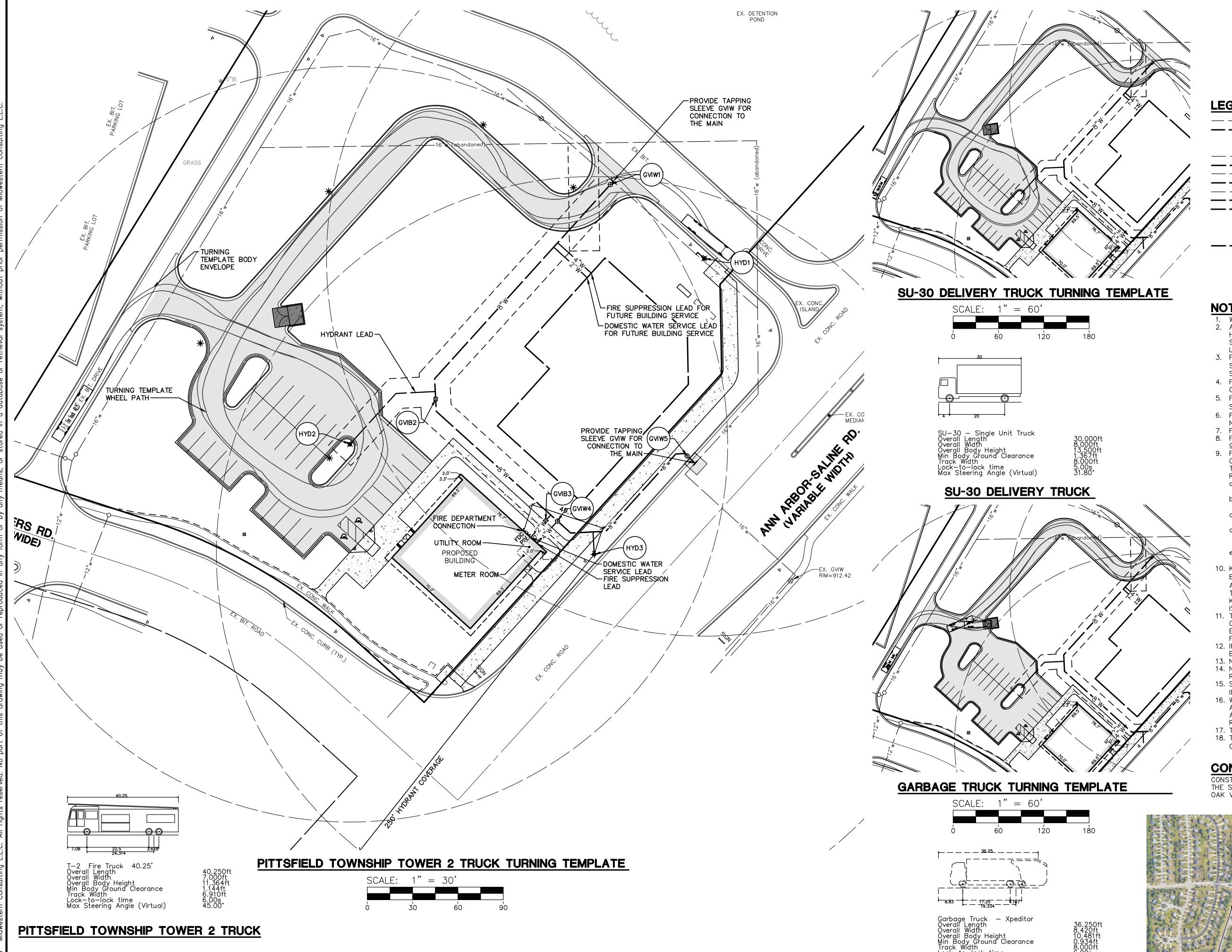


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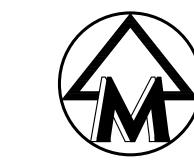
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The underground utilities shown have been located from field survey information and existing records. The surveyor makes no quarantees that the underground utilities shown comprise all such utilities in the area, either in-service or abandoned. The surveyor further does not warrant that the underground utilities shown are in the exact location indicated. Although the surveyor does certify that they are located as accurately as possible from the information available.

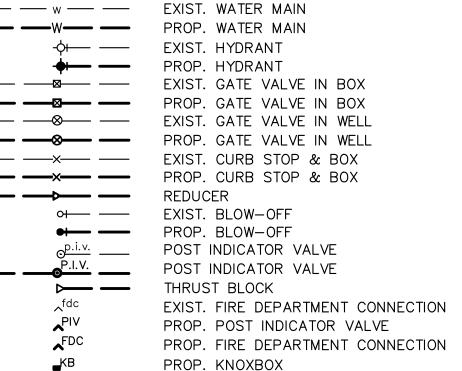


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### **LEGEND**



### **NOTES**

- WATER SERVICES ARE TO BE SEPARATE DOMESTIC AND FIRE LINES. ADDRESSING: NUMERICS SHALL BE A MINIMUM OF 12 INCHES IN HEIGHT AND CLEARLY VISIBLE WHEN APPROACHING THE BUILDING. SEE ARCHITECTURAL PLANS FOR EXACT DIMENSIONS AND
- 3. FLOW REQUIREMENTS: FLOW SHALL COMPLY WITH NFPA 13 STANDARDS AND SHALL MEET 2015 INTERNATIONAL FIRE CODE (IFC)
- STANDARDS FOUND IN APPENDIX B. TABLE B 105.1 OF THE CODE. 4. FIRE DEPARTMENT CONNECTIONS (FDC'S) SHALL BE WITHIN 50 FEET
- 5. FIRE DEPARTMENT CONNECTION (FDC): HOOK-UP LOCATION IS
- SUBJECT TO FIRE MARSHAL'S APPROVAL. 6. FDC'S SHALL BE 4 INCH STORZ CONNECTIONS OR (2) 2 1/2 INCH
- NST CONNECTIONS. 7. FDC ACCESS SHALL COMPLY WITH IFC 912.3.
- 8. FDC SIGNAGE SHALL BE PROVIDED AND SHALL COMPLY WITH IFC
- 9. FIRE PROTECTION ALARM AND DETECTION SYSTEM SHALL BE IN COMPLIANCE WITH ALL APPLICABLE CODES ADOPTED BY PITTSFIELD TOWNSHIP, INCLUDING NFPA 72, 2007 EDITION AND ALL OTHER REFERENCED STANDARDS.
- a. A HORN STROBE DEVICE SHALL BE INSTALLED ABOVE THE FDC AND SHALL ACTIVATE UPON SPRINKLER WATER FLOW. EMERGENCY RESPONDER RADIO COVERAGE SHALL COMPLY WITH
- 2015 IFC SECTION 510.
- c. EMERGENCY VOICE/ALARM COMMUNICATIONS SYSTEM SHALL COMPLY WITH 2015 IFC SECTION 907.6.2.2.
- OCCUPANT NOTIFICATION APPLIANCES SHALL ACTIVATE THROUGHOUT THE NOTIFICATION ZONES UPON SPRINKLER WATER
- e. PLACE SIGNAGE ON FIRE SUPPRESSION SYSTEM CONTROL ROOM DOOR (IFC 2015 SECTION 509.1) IF APPLICABLE.
- KNOX BOX EMERGENCY ACCESS SYSTEM WITH KEYS TO ACCESS THE BUILDING, THE FIRE SUPPRESSION SYSTEM CONTROL ROOM (IF APPLICABLE), AN ELEVATOR KEY, AND ANY OTHER KEYS TO AREAS THAT MAY BE RELEVANT DURING EMERGENCIES WILL BE REQUIRED. KNOX BOX WITH PROPER KEYS SHALL BE IN PLACE PRIOR TO ISSUANCE OF CERTIFICATES OF OCCUPANCY FOR THE BUILDINGS.
- 11. THE KNOX BOX SHALL BE MOUNTED NO HIGHER THAN 6 FEET FROM GRADE IN AN APPROVED LOCATION ON THE EXTERIOR FOR EMERGENCY ACCESS TO THE BUILDING AS WELL AS ACCESS TO THE FIRE SUPPRESSION SYSTEM CONTROL ROOMS IF APPLICABLE.
- 12. IF SITE ACCESS IS TO BE RESTRICTED DURING CONSTRUCTION, KNOX BOX LOCKS FOR GATES ARE TO BE PROVIDED.
- 13. NO FIREWALLS WILL BE CONSTRUCTED WITHIN THE BUILDING.
  14. NO SEPARATE FIRE SUPPRESSION SYSTEM CONTROL ROOM IS
- 15. STORAGE AREA FOR CONSTRUCTION MATERIALS SHALL NOT
- INTERFERE WITH FIRE/EMERGENCY SERVICES. 16. WATER SUPPLY FOR THE BUILDING SHALL MEET THE DEMAND FOR AN AUTOMATIC SPRINKLER SYSTEM, INCLUDING HOSE STREAM ALLOWANCE, PER APPENDIX B105.3 AND SHALL MEET THE MINIMUM REQUIREMENTS IN 2015 IFC, APPENDIX B, TABLE B105.1.
- 17. THE PROPOSED BUILDING WILL BE ONE STORY, 22 FT IN HEIGHT. 18. THE PROPOSED BUILDING WILL BE USED AS A NEW
- OFFICE/INSTITUTIONAL BUILDING.

### **CONSTRUCTION ACCESS NOTES**

CONSTRUCTION TRAFFIC WILL ENTER FROM ANN ARBOR-SALINE ROAD TO THE SITE AND EXIT THROUGH OAK VALLEY CENTER PERIMETER DRIVE TO OAK VALLEY DRIVE TO WATERS ROAD TO ANN ARBOR-SALINE ROAD.



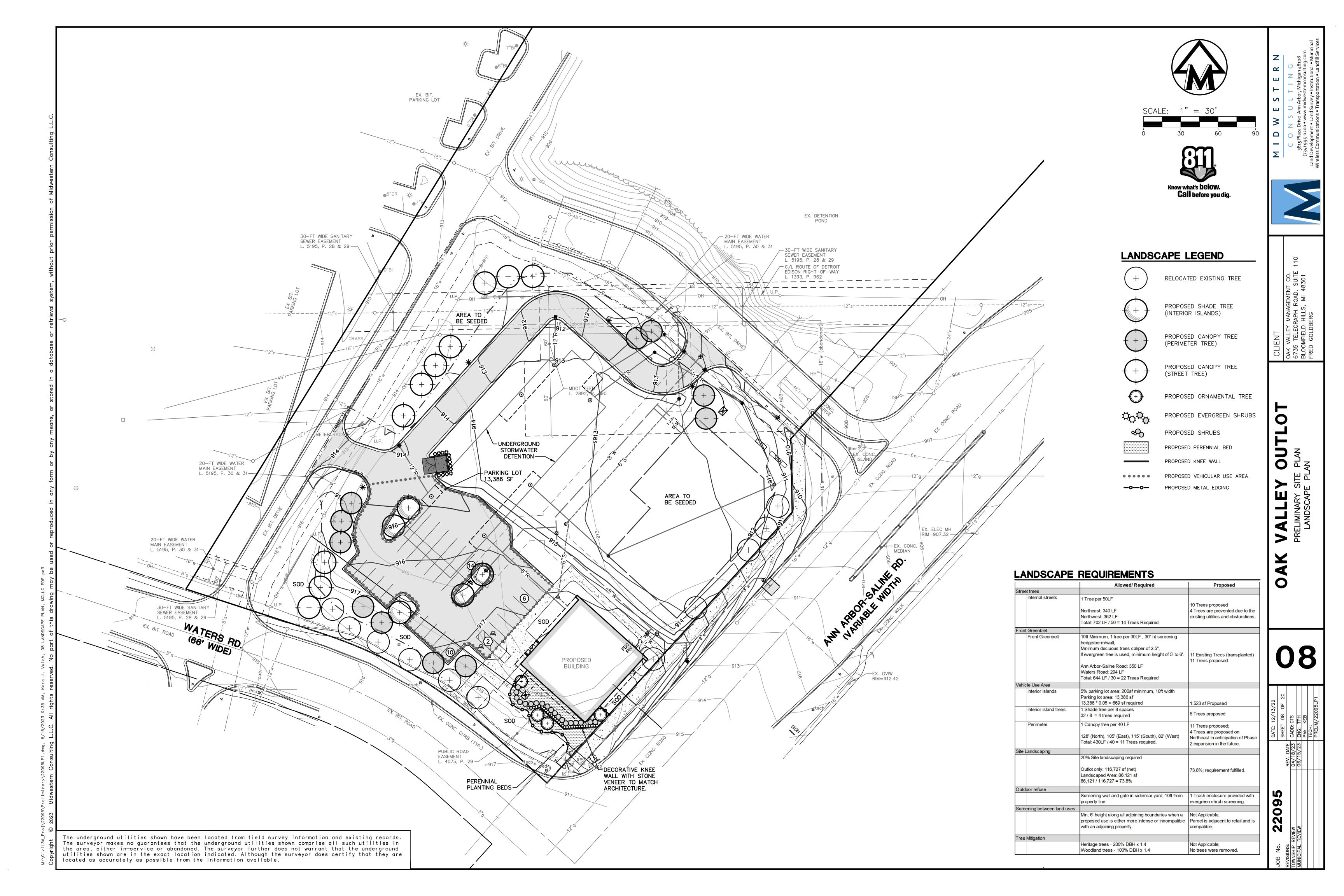
Lock—to—lock time Max Steering Angle (Virtual)

SU-30 DELIVERY TRUCK

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2-1/2" CAL. OR SMALLER DO NOT TRIM EVERGREENS SHRUB SHALL BEAR SAME RELATION TO FINISH GRADE AS IN NURSERY DO NOT PLANT SHRUBS TO WITHIN 42" OF TREE TRUNKS IN SHRUB BEDS 4" MULCH AS SPECIFIED 3" SAUCER --PLANTING BED TREATMENT REMOVE BURLAP FROM TOP 1/3 OF BALL; REMOVE ALL PLASTÍC WRAP AND FABRIC; REMOVE ALL ROT PROOF WRAP -PLANT MIXTURE AS SPECIFIED SCARIFY SIDES & BOTTOM TO ELIMINATE IMPERVIOUS SURFACES — SPECIAL PLANTING MIX REQUIRED FOR SET BALL ON 4" COMPACTED SOIL OR ERICACEOUS PLANTINGS AS SPECIFIED. 4" MOUND OF UNDISTURBED SUBGRADE —

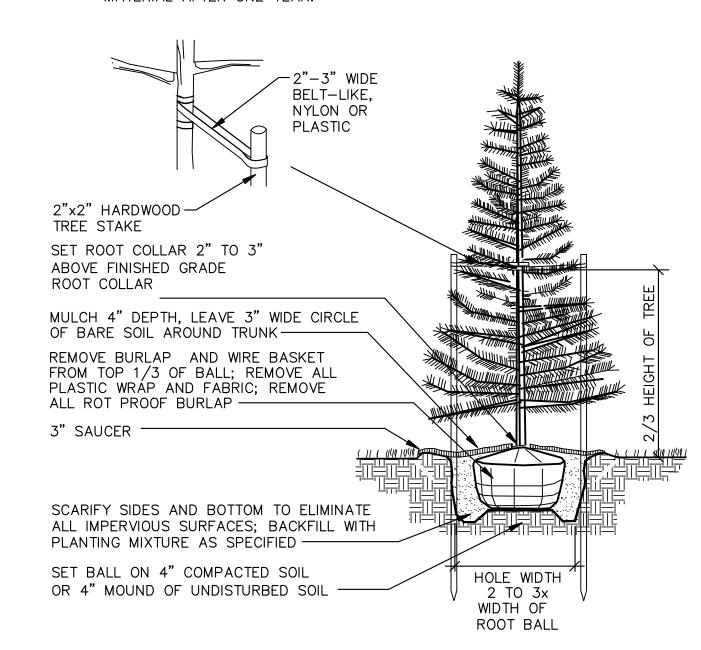
### SHRUB PLANTING DETAIL NOT TO SCALE

PRUNE 20% OF BRANCHES AND FOLIAGE RETAINING NORMAL PLANT SHAPE DO NOT TRIM EVERGREENS SHRUB SHALL BEAR SAME RELATION TO FINISH GRADE AS IN NURSERY DO NOT PLANT SHRUBS TO WITHIN 42" OF TREE TRUNKS IN SHRUB BEDS 4" MULCH AS SPECIFIED -3" SAUCER — PLANTING BED REMOVE BURLAP FROM TOP TREATMENT 1/3 OF BALL; REMOVE ALL PLASTIC WRAP AND FABRIC: REMOVE ALL ROT PROOF PLANT MIXTURE AS SPECIFIED SCARIFY SIDES & BOTTOM TO ELIMINATE IMPERVIOUS SURFACES — SPECIAL PLANTING MIX REQUIRED FOR SET BALL ON 4" COMPACTED SOIL OR ERICACEOUS PLANTINGS AS SPECIFIED. 4" MOUND OF UNDISTURBED SUBGRADE -

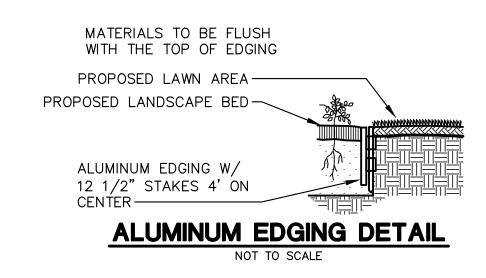
# **EVERGREEN SHRUB PLANTING DETAIL**

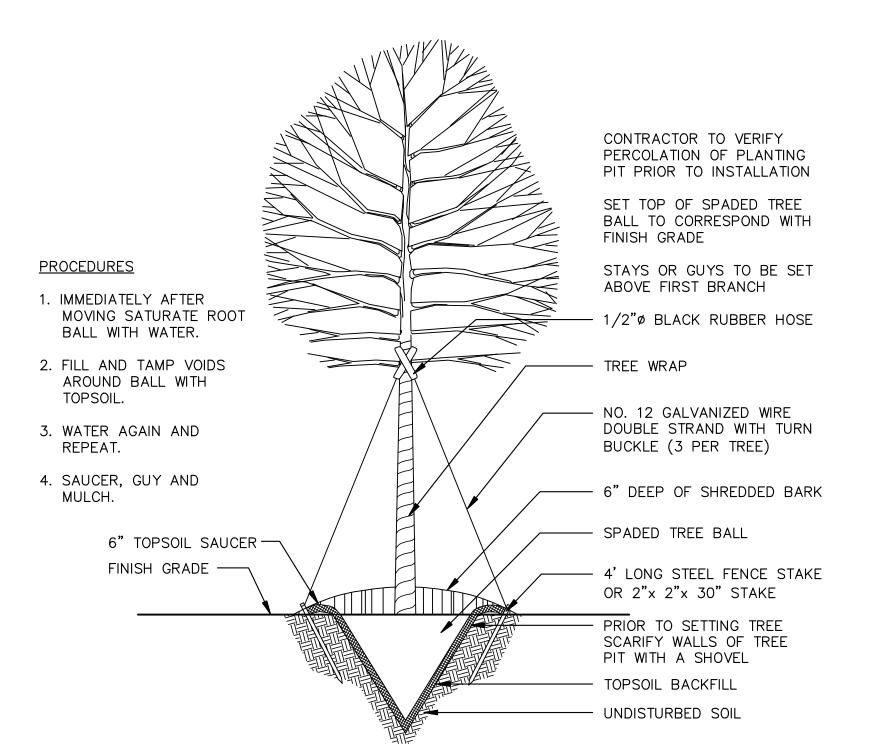
NOT TO SCALE

NOTE: REMOVE STAKING/GUYING MATERIAL AFTER ONE YEAR.



# **EVERGREEN TREE PLANTING DETAIL**



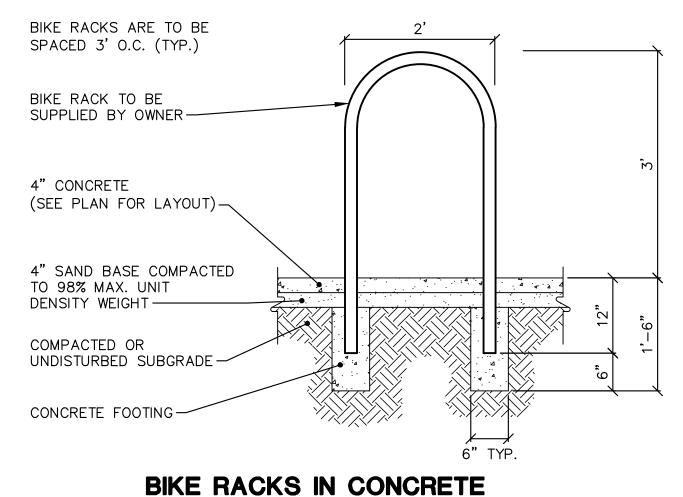


### **DECIDUOUS TREE - TRANSPLANTING DETAIL**

NOT TO SCALE

# **MAINTENANCE PLAN**

Perennial Beds	dscape Maintenance			
Maintenance Task	Winter	Spring	Summer	F
Soil Testing	Wille	Spring	Julillei	-
Place plant material orders as needed				
Prune shade trees, summer flowering shrubs, hedges and groundcovers				
Remove mulch from around crown of perennials; remove winter mulch				
Press perennials that frost heaved in the winter back into ground				
Check evergreen plants for removal of dead leaves				
Fertilize Trees and Shrubs, planting beds				
Clean flower beds, remove winter weeds and dead plant material left for winter				
interest				
Apply double shredded bark mulch to tree/shrub beds and ground leaf compost to flower beds				
Pressurize irrigation system and perform spring audit				
Aerate soil with fork hoe				
Remove all winter mulch from planting beds				
Divide and replant summer and fall blooming perennials (when growth is 3-4in				
high), cut back if needed				
Divide spring flowers after flowering				
Install new plantings, add compost during planting; pinching perennials may be				
necessary				
Replace dead/poor health perennials and grasses				
Water new transplants and newly planted trees and shrubs				
Prune spring blooming shrubs immediately after flowering				_
Placement of stakes/hoops to support perennials as needed				
Prune wither damaged branches or plants that have not begun to grow after last				
frost				
Replace mulch as necessary				
Weed flower beds routinely				
Install summer annual flowers				
Prune/pinch back perennials and grasses for height control and shaping				
Cut back/pinch spring flowering plants as needed				
Inspect plants for pests and treat as necessary				
Thin out perennial beds and prune plants as needed				
Water beds as needed				
Deadhead spent blooms, deadleaf yellowing foliage				
Fertilize perennials, especially cut back plants and heavy feeding perennials				
Cut back perennials that bloom second time to basal foliage				
Prune perennials and shrubs to maintain spacing in bed				
Divide and plant spring and summer flowering perennials				
Add touch up mulch to planting beds		-		
Rake leaves, mow or shred for composting				
· -				
Clean up planting beds - remove yellowing foliage not left for winter interest, remove stakes/hoops				
Top-dress planting beds with organic matter if not done in spring				
Turn off irrigation system and flush out				
Winter mulch tender plants once ground is frozen				
Turkey August				
Turfgrass Areas  Maintenance Task	Winter	Spring	Summer	F
Remove wet leaves, fallen branches/twigs				
Apply pre-emergent crabgrass control herbicide to cool season turfgrass				
Fertilize lawn				
Pressurize irrigation system and perform spring audit				
Aerate lawn as needed (every two years)				
Inspect for grubs, treat as needed				
Hand remove weeds, Spot application of herbicide if necessary				
Weekly mowing of turfgrass (when reaches height of 2.5 to 3 in.), leave grass				
clippings, remove clumps				
Bi-weekly edging of turfgrass				
Deep water lawn areas (~1 inch per week)				
Prepare and seed bare areas				
Water newly seeded areas				
Rake leaves or mow and leave for composting				
Fertilize lawn				
Turn off irrigation system and flush out		1		
Routinely remove debris such as leaves, twigs, trash, etc.				



### LANDSCAPE NOTES

- Maple Road corridor and entrances, eastern conflicting land use buffer, southern conflicting land use buffer on western parcel, and pedestrian pathway corridor. Agricultural areas to be restored with native seeding and undisturbed areas will not be irrigated. Contractor to provide irrigation shop drawings for review and approval.
- 5. Restore areas to be seeded with native vegetation and shrub planting beds with a minimum of twelve (12) inches of topsoil and then seed/fertilize/mulch. Restore all other
- 6. All disturbed areas not to be seeded with seed mixes identified on the Landscape Plan shall be lawn areas. Fertilizer for the initial installation of lawns shall provide not less
- less than two percent (2%) potassium and four percent (4%) phosphoric acid.

- d. 15% Pennifine Perennial Ryegrass
- 8. Seed shall be applied at a rate of five pounds (5 lbs) per 1000 sq ft. Mulch within 24 hours with two (2) tons of straw per acre, or 71 bales of excelsior mulch per acre. Anchor straw mulch with spray coating of adhesive material applied at the rate of 150 gals. /
- 9. After the first growing season, only fertilizers that contain NO phosphorus shall be
- 10. Areas identified on the Landscape Plan with seed mixes shall be seeded with specified seed mixes from Cardno, or equivalent as approved by landscape architect. Temporary
- 11. All seeded areas with slopes less than 1:3 (one vertical foot for every 3 horizontal feet) shall be mulched with straw mulch at the rate of two (2) bales per 1,000 square feet. All seeded areas with slopes greater than 1:3 shall be seeded and biodegradable erosion control blanket North American Green SC150, or equivalent, shall be applied with
- until the prepared soil becomes frozen. Evergreen plants shall be planted between
- 13. Native seeding areas shall be seeded after May 1, (when soil is free of frost and in workable condition), but before June 15 or after October 1, but before November 30 (or prior to ground freezing) or as approved by Landscape Architect or guaranteed by
- 12. All planting beds are to receive four (4) inches of shredded bark mulch. 13. All trees to be located a minimum of 10 feet from public utilities.
- 15. All single trunk, deciduous trees shall have a straight and a symmetrical crown with a central leader. One sided trees or those with thin or open crowns shall not be accepted.
- not been sheared in the last three (3) growing seasons. 17. All compacted subgrade soils in proposed landscape beds shall be tilled to a minimum 12-
- 18. Planting Soil: Existing, in-place or stockpiled topsoil. Supplement with imported topsoil as needed. Verify suitability of existing surface soil to produce viable planting soil. Remove
- stones, roots, plants, sod, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth. Mix surface soil with the following soil amendments to produce planting soil:
- soil test to adjust soil pH.
- aluminum sulfate only on recommendation of soil test to adjust soil pH.
- Architect to adjust soil texture.
- on recommendation of soil test to adjust soil fertility. 19. Native seeding installation shall be performed by a qualified contractor with documented experience of successful established native seeding. Seed shall be installed per
- 20. At the time of plant and seed delivery for the detention basins, including native seed and live plantings, a Washtenaw County Water Resource Commissioner landscape reviewer

### Native Landscape Maintenance

- Contractor is responsible for obtaining any necessary permits for herbicide applications. All herbicide applied to native areas shall be suitable for aquatic
- environments. 2. During the first growing season, the seeded areas shall be mowed monthly to a height of 4 to 6 inches when vegetation reaches 10 to 12 inches in height through September. Annual invasive weeds such as crabgrass, purple knapweed, purple loosestrife, yellow or white sweet clover, black medic or other invasive plants shall be spot controlled with
- herbicide. Do not hand pull invasive weeds during first growing season. 3. During the second growing season, the seeded areas shall be mowed approximately every month to a height of 8 inches when vegetation reaches 12 to 18 inches. Annual invasive weeds noted above shall be spot controlled with or hand pulled as appropriate.
- during early spring (between February and April) and raked to remove clippings. Annual invasive weeds noted above shall be spot controlled with herbicide appropriate or hand pulled as appropriate.
- 5. Long-term maintenance of the native seeded areas and detention basin shall be performed by the Owner. Maintenance shall include mowing to 4 inches in height during early spring (between February and April) and raking to remove clippings. Spot treatment/removal of invasive weeds may be necessary if localized areas become dominated by invasive weeds.

Landscape Note

1. For any plant quantity discrepancies between the plan view and the plant schedules, the plant schedule shall take precedence.

2. Plant materials shall be selected and installed in accordance with standards established by Pittsfield Township.

3. In-ground automatic irrigation shall be provided for common open space areas including

4. All diseased, damaged or dead material shown on the site plan as proposed plantings shall be replaced by the end of the following growing season.

disturbed areas with a minimum of four (4) inches of topsoil and then seed/

than one (1) pound of actual nitrogen per 1,000 sq ft of lawn area and shall contain not

7. Lawn (turfgrass) seed mix shall consist of:

a. 15% Rugby Kentucky Bluegrass b. 10% Park Kentucky Bluegrass

c.40% Ruby Creeping Red Fescue

e. 20% Scaldis Hard Fescue

used on the site.

cover crop shall be included with all seed mixes. Seeding rates and installation techniques shall be confirmed with supplier.

biodegradable stakes. 12. Deciduous plants shall be planted between March 1 and May 15 and from October 1

March 1 and June 1 and from August 15 to September 15.

14. Proposed trees will be planted a minimum of 10 feet apart.

16. All evergreen trees shall be branched fully to the ground, symmetrical in shape and have

inch depth prior to placement of topsoil, geotextile fabric, or other planting media as

a. Ratio of Loose Compost to Topsoil by Volume: 1:4.

b. Weight of Lime per 1000 Sq. Ft.: Amend with lime only on recommendation of

c. Weight of Sulfur or Aluminum Sulfate per 1,000 Sq. Ft.: Amend with sulfur or

d. Volume of Sand: Amend with sand only on recommendation of Landscape e. Weight of Slow-Release Fertilizer per 1,000 Sq. Ft.: Amend with fertilizer only

manufacturer's specification via hand broadcast

must be present. Contact Catie Wytychak at wytychakc@ewashtenaw.org or 734-222-6813 to coordinate.

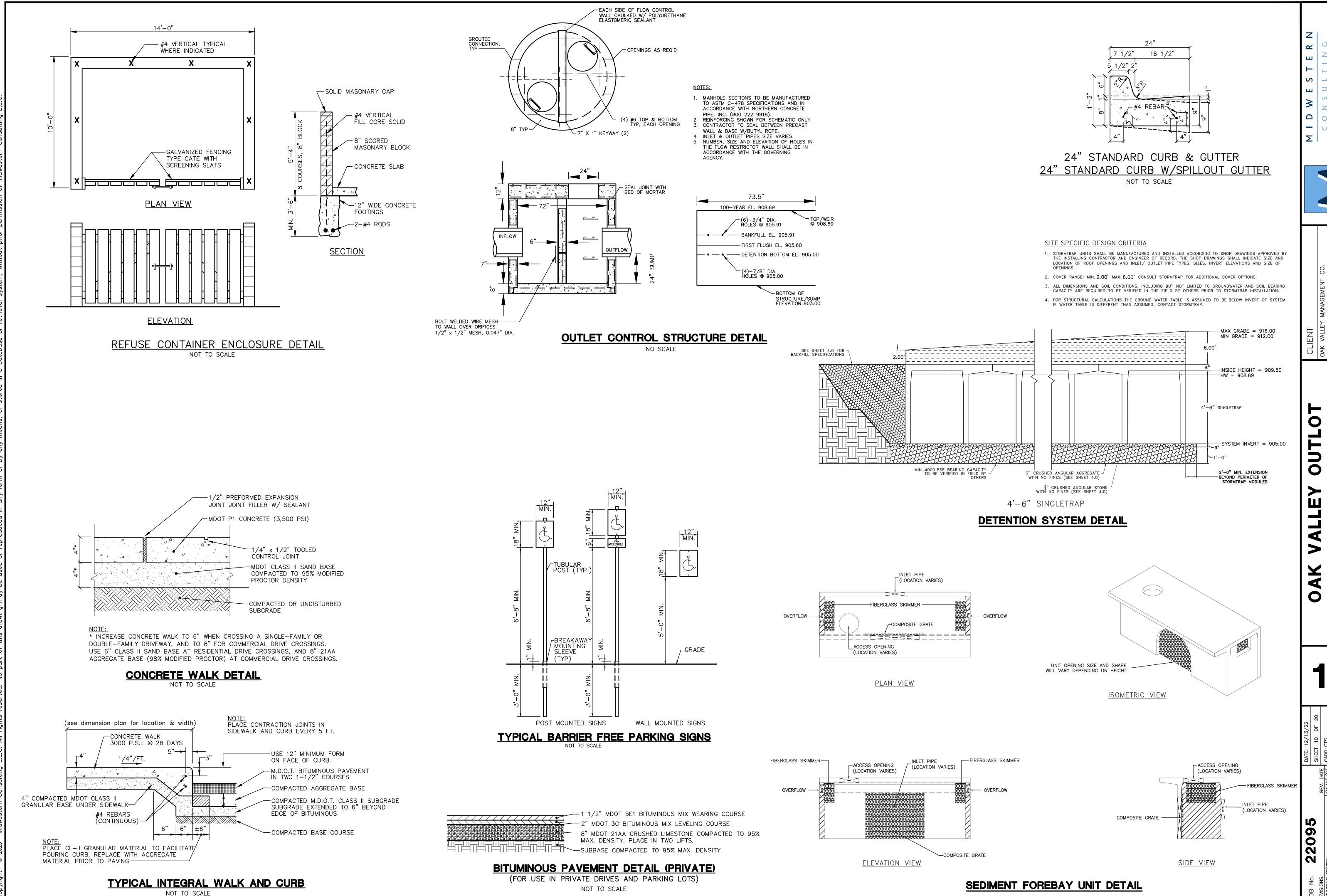
- 1. Native seeding areas shall be maintained by contractor for three years after installation to promote establishment of native vegetation and reduce weeds and invasive species.
- 4. During the third growing season, the seeded area shall be mowed to 4 inches in height

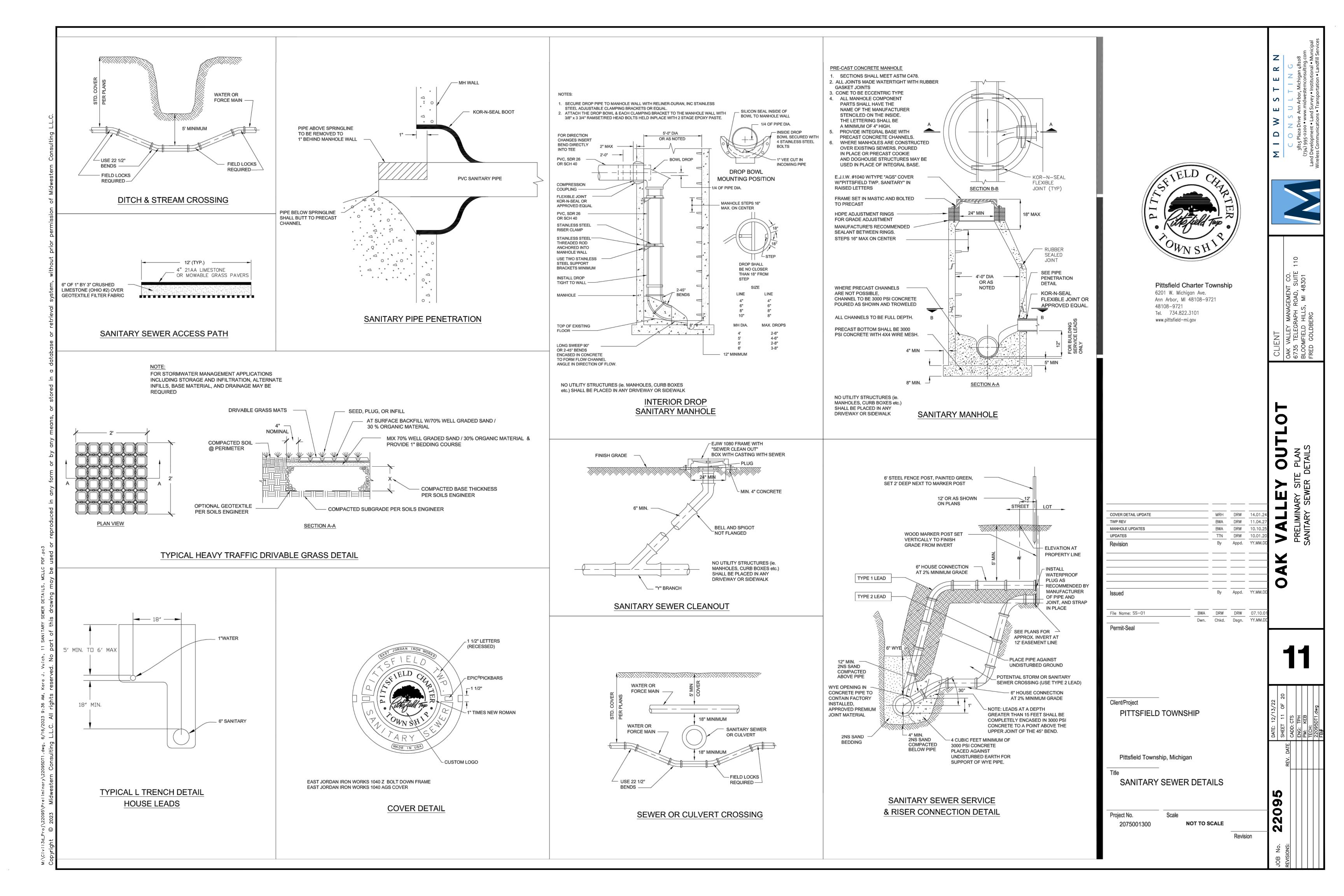
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### 1.01 DESCRIPTION

- A. The CONTRACTOR shall furnish all labor, tools, equipment and materials to construct all sanitary sewers, manholes and necessary appurtenant work as herein specified. No sewers shall be accepted until the sewer system has passed the system acceptance tests.
- 1.02 TESTING
  - A. General
  - 1. The CONTRACTOR shall furnish all equip\-ment and personnel to conduct system acceptance tests as specified herein on all completed sewers. All tests shall be conducted under the supervision of the ENGINEER. No acceptance tests shall be conducted until the entire sewer system is constructed and has been installed for not less than 30 days.
  - 2. The CONTRACTOR may desire to make an air test prior to backfill for his own purposes but the line acceptance tests shall be conducted after backfilling or extensions.
  - 3. All sewer lines shall be televised while running enough water through the line to be visible at the next downstream manhole.
  - All sewer lines shall be checked for alignment.
  - 5. All manholes shall be tested for leakage. All PVC lines shall be tested for deflection.
  - 6. Sewer pipe 30 inches and smaller shall be air tested. Sewer pipe larger than 30 inches shall be tested by either infiltration or exfiltration and shall be tested in lengths of 1600 feet or less.
  - 7. Should the results of any test fail to meet the criteria established in this Specification, the CONTRACTOR shall, at his own expense, locate and repair rejected section and retest until it is within specified allowance.
  - B. Test for Leakage Air Test
  - Section 33-95 (pg 30-6) 2004-Ten State Standards.
  - 2. After a manhole-to-manhole section of line has been backfilled and cleaned, it shall be plugged at each manhole with pneumatic plugs inflated to 35 psig internal pressure. The design of the pneumatic plugs shall be such that they will hold against the line test pressure without requiring external blocking or bracing.
  - 3. There shall be three (3) hose connections to the pneumatic plug. One hose shall be used only for inflation of the pneumatic plug. The second hose shall be used for continuously reading the air pressure rise in the sealed line. The third hose shall be used only for introducing low pressure air into the sealed line.
  - 4. There shall be a 0-30 psig gauge for reading the internal pressure of the line being tested. Calibrations from the 1-10 psig range shall be in tenths of lbs (not ounces) and this 0-10 portion shall cover 90% of the complete dial range.
  - 5. Low pressure air shall be introduced into the sealed line until the internal air pressure reaches 4.0 psig greater than the average back pressure of any ground water pressure that may be over the pipe. At least two (2) minutes shall be allowed for the air pressure to stabilize. After the stabilization period, the third hose shall be disconnected.
  - 6. The portion of line being tested shall be accepted if the portion under test meets the following conditions.

### a. DI, and RCP Pipes

(1) The time requirement for the pressure to decrease from 3.5 to 2.5 psig (greater than the average back pressure of any ground water that may be over the pipe) shall not be less than the time given in the following table:

	Min. Holding Time
Dina	_
<u>Pipe</u>	Seconds/100 ft. Pi
4 to the	40
4-inch	18
6-inch	42
8-inch	72
10-inch	90
12-inch	108
15-inch	126
18-inch	144
21-inch	180
24-inch	216
27-inch	252
30-inch	288

(2) In areas where ground water is known to exist, the CONTRACTOR shall install a 1/2-inch diameter capped pipe nipple, approximately 10 inches long, through the manhole wall on top of one of the sewer lines entering the manhole. This shall be done at the time the sewer line is installed. Immediately prior to the performance of the line acceptance test, the ground water level shall be determined by removing the pipe cap, blowing air through the pipe nipple into the ground so as to clear it, and then connecting a clear plastic tube to the pipe nipple. The hose shall be held vertically and a measurement of the height in feet of water shall be taken after the water stops rising in this plastic tube. The height in feet shall be divided by 2.3 to establish the lbs of pressure that will be added to all readings. For example, if the height of water is 11-1/2 ft, then the added pressure will be 5 psig. This makes the 3.5 psig to be 8.5 psig, and the 2.5 psig to be 7.5 psig. The 1 lb allowable drop and the timing remains the same.

### a. PVC Pipe

(1) The time requirement for the pressure to decrease from 3.5 to 3.0 psig (greater than the average back pressure of any ground water that may be over the pipe) shall not be less than that shown in the following table:

Pipe	Holding	Minimum
Size	Time	Holding Time
(seconds)	(seconds)	
4-inch	0.190xL	113
6-inch	0.427xL	170
8-inch	0.760xL	227
10-inch	1.187xL	283
12-inch	1.709xL	340
15-inch	2.671xL	425
18-inch	3.846xL	512

(2) If any section of the sewer fails to meet this requirement, the CONTRACTOR shall perform a television inspection of the faulty section and repair or replace at his own expense all defective materials and/or workmanship to the satisfaction of the ENGINEER. The test procedure shall be repeated until the results are acceptable.

### C. Test for Infiltration

- 1. Sewer pipe over 18 inches shall be tested to measure the infiltration of ground water. If the measured leakage exceeds 100 gallons per inch diameter per mile of pipe per 24 hr period, the CONTRACTOR shall locate the points of excessive leakage and make the necessary repairs at his own expense.
- 2. In the event the line does not pass the infiltration test as stated above, the test shall be repeated after suitable repairs have been completed.

### D. Test for Exfiltration

- 1. Where the ground water provides less than a 2 ft head on the sewer, an exfiltration test shall be conducted by filling the sewer with water to a 4 ft head or 4 ft above the ground water level, whichever is greater. The allowable water loss shall be 100 gal/in./mi/day as calculated above
- 2. After the sewer has been filled with water, 4 hrs time shall be allowed for water absorption by the pipe before exfiltration tests are initiated
- 3. For the purpose of establishing the 4 ft test head, the head shall be measured from the center of the sewer pipe at the midpoint of the test section length. This procedure shall be used for both infiltration and exfiltration tests.

### E. Test for Manhole Leakage

- 1. All manholes shall be tested for leakage by using plugs on inleting-outleting sewers, and filling the manholes with water to the top of the man\-hole. Four hours shall be allowed for water absorption by the manhole before testing is initiated. Allowable exfiltration for 48-inch diameter manholes shall be 2 gallons per foot of depth per day.
- F. Test for Alignment
- 1. All sewers shall be laid accurately to the line and grade designed by the ENGINEER. The sewers will be tested for alignment by shining a light through the pipe at a manhole and viewing the light from an adjacent manhole. Any section of sewer in which a light cannot be seen from one manhole to the next shall be corrected to the satisfaction of the ENGINEER to pass this test.

### G. Test for Deflection of PVC Pipe

- 1. PVC pipe sewers shall be installed in such a manner that the initial deflection of the conduit shall conform to the latest revision of ASTM D-3034.
- 2. Deflection of PVC pipe shall be tested by pulling a rigid pig or equivalent through the pipe. The pig shall be constructed in accordance with the following table of maximum outside diameters and shall be submitted to the ENGINEER for review before testing is initiated.

Pipe	Pig
<u>I.D.</u>	<u>O.D.</u>
6 inches	5.33 inches
8 inches	7.11 inches
10 inches	8.87 inches
12 inches	10.55 inches
15 inches	12.90 inches
18 inches	15.74 inches

The pig shall be drawn by hand through the pipe from manhole to manhole. Any portion of pipe through which the pig passes freely shall be deemed to have passed the deflection test. Sections of pipe through which the pig does not pass shall be located, un\-covered and the pipe zone bedding improved and backfilled by the CONTRACTOR at his own expense. The pipe shall then be retested before acceptance is granted.

### H. Material Tests

1. The CONTRACTOR shall have tests of pipe and strength made by an independent testing laboratory. Tests of up to 4 lengths of sewer pipe per hundred lengths may be required to show compliance with the Specifications. All pipe delivered to the job site shall be accompanied with a manufacturer's certificate of compliance to the Specifications.

### 1.03 SUBMITTALS

A. The CONTRACTOR shall submit shop drawings or data sheets for all pipe, manholes, manhole castings, pipe to manhole connections, and valves. The Contractor shall submit certification letter for all pipe proposed on the project. The letters shall contain the following: Contractor name, project name, township name, current date, certification of pipe provided and letterhead of the certifying company.

### 2.00 PRODUCTS

### 2.01 SEWER PIPE

- A. Pipe for sewer 24-inch diameter and smaller shall be polyvinyl chloride (PVC). Pipe for 30-inch diameter and larger shall be PVC truss pipe. Ductile iron pipe and reinforced concrete pipe shall be used as specified by the ENGINEER.
- B. Pipe for service leads 4 though 8 inches in diameter shall be polyvinyl chloride (PVC).
- C. Reinforced concrete pipe shall be no less than the latest revision of ASTM C76, with the class designation as shown on the Plans or in the Pro\-posal.
- D. PVC pipe 4 inches through 15 inches in diameter shall meet or exceed all of the requirements of the current ASTM D-3034 SDR-26 polyvinyl chloride sewer pipe and fittings. 18-inch diameter PVC pipe shall meet or exceed all the requirements of the current ASTM F-794 SDR 26 polyvinyl chloride sewer pipe and fittings. Samples of pipe and physical and chemical data sheets shall be submitted to the ENGINEER for review. Approval shall be obtained before pipe is purchased.
- E. If the sewer pipe is greater than 15 feet deep PVC pipe shall be SDR 21.
- F. Truss pipe shall meet or exceed all of the requirements of the current ASTM D2680.
- G. Ductile iron pipe shall meet or exceed all the requirements of ANSI A21.50 with a cement lining.

### A. Fittings shall be of the same material as the pipe, and in no case shall the walls be thinner than that of the pipe furnished.

- B. Wye and tee fittings for PVC pipe shall be reviewed by the ENGINEER before purchasing.
- C. The dry fit of all fittings must be snug. If the fit is such that it is loose, the pipe or fitting will be

### 2.03 SEWER PIPE JOINTS

2.02 SEWER PIPE FITTINGS

- A. Concrete pipe joints shall be made of a resilient material conforming to the latest revision of ASTM Designation C443. Proper lubricant shall be furnished by the joint manufacturer.
- B. Concrete pipe for use with rubber joints shall be smooth and precisely formed to provide a uniform annular space for joint materials.
- C. PVC pipe shall be jointed with ring gusseted bell ends. (ASTM-D3212) Jointing materials shall be applied to the bell end of the pipe at the point of manufacture in such a manner that a tight uniform joint will be achieved and such that when the joint is made up in the field, the joint material will not roll or tear from the pipe. A proper joint lubricant shall be furnished by the pipe manufacturer.

### 2.04 REINFORCED CONCRETE MANHOLES

rejected as faulty and of improper size.

- A. Manholes shall conform to the current ASTM specifications for precast reinforced concrete manhole sections, serial designation C478. Manhole section joints shall conform to ASTM C990-96. Cone sections shall be straight side type, with an offset step configuration.
- lettering or logo shall be a minimum of 4-inches high.
- C. Manholes constructed over an existing sewer line shall have a doghouse mudded to an 8-inch thick cookie. The bottom of the existing pipe shall be the channel. All other manholes shall have precast integral base sections with pre-formed concrete channels.
- D. All channels shall be constructed to the full flow depth of the pipe.

### 2.05 MORTAR FOR MANHOLES

aggregate.

### 2.06 MANHOLE FRAMES AND COVERS

- A. Manhole frames and covers shall weigh not less than 350 lbs. Each frame and cover shall have machined bearing surfaces and shall be suitably notched for convenient removal of the cover. Each cover shall be marked with the Pittsfield Township logo and the letters, PITTSFIELD TWP SANITARY SEWER integrally cast into the cover.
- other asphaltum coating reviewed by the ENGINEER.

### 2.07 MANHOLE STEPS

A. Steps shall be plastic coated steel. They shall be M.A. Industries PS1-PF or PS1-B, or approved equal.

### 2.08 MANHOLE CONNECTIONS

- A. Sewer pipe (6-inch to 24-inch) to manhole connections shall be through: 1) a flexible rubber boot which shall be securely clamped into a core-drilled pipe port. Pipe ports shall be core-drilled at the point of manhole manufacturer and shall be accurately located within 1/2-inch of proposed sewer centerline (Kor-N-Seal); or, 2) a self-adjusting mechanical pipe to manhole seal which provides a resilient flexible and infiltration-proof joint (Res-seal); or, 3) a flexible rubber wedge firmly rammed into a rubber gasket which is cast into the manhole (Press Wedge II), or equal. All flexible pipe to manhole connections shall be installed per the manufacturers
- B. Neoprene rubber for the manhole boot shall meet ASTM Specification C443 and shall have a minimum thickness of 3/8-inch. Pipe clamp bands shall be of corrosion-resistant steel.
- C. Sewer pipe over 24 inches to manhole connections shall be in accordance with details shown on the Plan.

### SANITARY MANHOLE ADJUSTMENTS

- A. All final grade adjustment of manhole covers and frame assemblies shall be completed utilizing injection molded High Density Polyethylene (HDPE) adjustment rings as manufactured by LADTECH, INC. or approved equal. The adjustment rings shall be manufactured from polyethylene plastic as identified in ASTM Designation D 1248.
- B. All adjustment for matching road grade shall be made utilizing a molded indexed slope ring.
- C. Each adjustment ring shall be sealed with a 3/16 to 1/4 inch bead of butyl rubber sealant per the manufacturer's instructions. Sealant shall meet ASTM specification C-990.
- D. All castings and adjustment rings shall be securely fastened to the cone of the structure with four 3/8-inch threaded rods. The rods shall be galvanized or stainless steel anchored to the structure with Redhead concrete anchors or equal. Stainless steel or galvanized nuts and washers shall be used to attach the casting.

### MANHOLE DROPS

- A. Manhole drop connections shall be interior drops using the drop bowl as produced by Reliner-Duran Inc.
- B. Drop bowl model A-4" shall be used for all lines up through full 6-inch inlets. Drop bowl model A-6" shall be used for all 8-inch inlets. Drop bowl model B-8" shall be used for all 10-inch inlets. Lines larger than 10 inches shall be as directed by the ENGINEER.
- C. The force line hood shall be attached on models A-4" and A-6" when the incoming line is from a force main or the slope is 3 percent or greater.
- D. The drop pipe shall be secured to the manhole wall with Reliner-Duran, Inc. stainless steel adjustable clamping brackets or approved equal.
- E. The drop bowl and each clamping bracket shall be attached to the manhole wall with 3/8-inch x 3 3/4-inch
- F. The incoming pipe shall be trimmed such that it protrudes 2 inches into the manhole.
- G. A 1-inch V shaped notch shall be cut into the bottom edge of the incoming pipe.

### 3.00 EXECUTION

### 3.01 EXCAVATION AND BACKFILL

A. All excavation and backfill above a line 12 inches above the crown of the pipe shall conform to Section 2.04, Earthwork, of these Specifications.

### 3.02 BEDDING

- A. Reference Section 33.83a of 10 State Standards.
- B. Reference Section 33.83b of 10 State Standards.
- C. Ductile iron, and concrete pipes shall be laid on a compacted granular material placed on the bottom of the trench to a depth of not less than 3 inches for 24-inch and smaller pipe and not less than 4 inches for pipe larger than 24-inch conforming to Class B bedding as shown on the Plans. Where shown on the Plans or required by the ENGINEER, concrete encasement or concrete cradle shall be used.
- D. PVC pipe shall be laid on a compacted granular material placed on the bottom of the trench to a depth of not less than 4 inches conforming to Class B bedding as shown on the Plans. Where shown on the Plans, or where the pipe passes under a road with less than 4 ft of cover, the pipes shall be encased.
- E. For all pipes, compacted granular material shall be placed at the sides of the pipe and cover not less than 12 inches above the crown of the pipe.
- F. "Granular Material" shall be class 2NS sand, pea gravel or crushed stone conforming to ASTM C33 Size No. 67 placed in not more than 6-inch layers and com\-pacted to not less than 95% standard density for PVC and 90% standard density for reinforced concrete.
- G. Pea gravel or crushed stone used for bedding shall be separated from the sand backfill with a non-woven geotextile fabric. The fabric shall be Amoco 4551, or approved equal.

### 3.03 PIPE INSTALLATION

- A. Installation of PVC pipe shall be in confor\-mance with ASTM D2321-89.
- B. All pipe shall be laid true to the required lines and grades. All trenches when pipe laying is in progress shall be kept dry; and all pipes and fittings shall be uniformly supported on a properly trimmed bedding with holes at each joint to receive bells. All pipe shall be laid with bells uphill.
- C. All joints shall be made up in accordance with the manufacturer's instructions using materials and equipment especially prepared for the type of joint to be used.
- D. The grade as shown on the profiles is that of the pipe invert and that to which the work must conform. The grade shall be kept by levels, laser or other tools which shall be furnished by the CONTRACTOR at his expense. Each pipe shall be laid accurately to the line and grade as shown on the Plans and in such manner as to form a close concentric joint with the adjoining pipe and prevent sudden offsets of the invert. The interior of sewers shall, as the work progresses, be cleaned of all dirt, cement, debris and other superfluous materials of every description. Bulkheads shall be used to keep foreign materials out of the open end of the sewer when work is not in progress.
- E. The location of the piping as shown on the Plans has been determined to avoid, insofar as possible, interference with trees or structures or fixtures above ground and other underground mains, services, utilities, or structures. Any change in location or alignment of piping which may be found more feasible or practicable as the work progresses shall be made by the CONTRACTOR, as the ENGINEER may direct.
- F. All pipe and fittings shall be carefully lowered and moved into position in trench or vault in a controlled manner such as will prevent damage to the pipe and any coatings or lining. An excessive amount of scratching on the surface of the PVC pipe will be considered cause for rejection.
- G. The trench shall be backfilled closely behind the pipe laying. Unless otherwise directed or permitted by the ENGINEER, the backfilling shall follow and be completed to the top of the trench within two pipe lengths
- H. All cutting of the pipe shall be done in a neat workmanlike manner with the least amount of waste and without damage to existing or new lines. A fine tooth saw, tubing cutter or similar tool may be used to cut PVC pipe. Cuts must be square. Ragged edges shall be removed with a cutting tool or file.
- I. After cutting bell and spigot or socket pipe, a stop mark shall be made with a pencil or crayon using dimensions as shown by the manufacturer's instructions or by using another pipe in the field as a guide.
- J. Breaks in pipe or joints shall be repaired to the satisfaction of the ENGINEER and at the expense of the

### 3.04 CONNECTIONS TO EXISTING MANHOLES AND OTHER RIGID STRUCTURES

for Kor-N-Seal boot sealing surface.

- A. When a sewer is connected to an existing manhole, a hole adequate to receive the new pipe shall be cut
- B. If the existing manhole is of brick construction, a single rowlock of brick shall be turned over the new pipe and the existing manhole brick work shall be cleaned, pointed and given a 1/2-inch mortar coat on the outside
- C. For connections to existing precast reinforced concrete manholes, a hole shall be cored into the concrete manhole wall to receive the pipe. A Kor-N-Seal boot or engineer approved equal shall be clamped into the cored hole and used to make the connection.

D. For connections to existing fiberglass manholes, a hole shall be cored into the manhole wall to receive the

pipe. A Kor-N-Seal boot or engineer approved equal shall be installed using fiberglass reinforced pipe stubout

### 3.05 STREAM AND RIVER CROSSING

- A. Whenever a pipe is required to cross a stream or river, all work shall be in accordance with the provisions of Act 346, the Inland Lakes and Streams Act of 1962, and the rules and regulations promulgated thereunder. Stream crossings and all restoration required shall be completed within five days of the construction.
- B. The CONTRACTOR shall utilize such con\-struction methods as are feasible and practicable to divert or stop stream flow to lay the pipe in the dry. Pipe shall be ductile iron, mechanical joint, or compression gasket joint pipe with joints at transition to other types of sewer pipe encased with no less than 1 cu yd of concrete, placed at a minimum of 6 inches thickness around the pipe. After the sewer is properly laid, jointed and encased, the stream-channel shall be cleaned of dirt and debris resulting from the CONTRACTOR's operations.
- C. After the crossing is made, heavy riprap and sodding shall be placed to protect the banks from corrosion as shown on the Plans.

PCT July 2008

Pittsfield Charter Township 6201 W. Michigan Ave. Ann Arbor, MI 48108-9721 48108-9721 Tel. 734.822.3101 www.pittsfield-mi.gov

UPDATES

UPDATES

Revision

File Name: SS-02

Permit-Seal

Client/Project

2075001300

PITTSFIELD TOWNSHIP

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BWA DRW 10.10.25 TTN DRW 10.01.20 YY.MM.D By Appd. YY.MM.D

BWA DRW DRW 07.10.0 Dwn. Chkd. Dsgn. YY.MM.D

BWA DRW

By Appd.

Pittsfield Township, Michigan SANITARY SEWER SPECIFICATIONS

NOT TO SCALE Revision

0

B. All manhole component parts shall have the name of the manufacturer stenciled on the inside. The

A. Mortar for plastering manholes shall be made of one part Portland cement and two parts fine

- B. Covers shall be of the "self-sealing" design having a continuous gasket glued in a machined groove and a concealed pickhole. Frames and covers shall be East Jordan 1040Z, with Type AGS cover.
- C. All manhole frames and covers shall be coated by the manufacturer with coal tar pitch varnish or

### STORM SEWER AND DRAINAGE STRUCTURES

A. Furnish all labor, tools, equipment and materials to construct all storm sewers, and drainage structures as herein 2.07 specified. No sewers shall be accepted until the sewer system has passed the system acceptance tests.

1. The CONTRACTOR shall furnish all equipment and personnel to conduct system acceptance tests as specified herein on all completed sewers. All tests shall be conducted under the supervision of the ENGINEER. No acceptance tests shall be conducted until the entire sewer system is constructed or just prior to placing the line in service providing the sewer pipe has been installed for not less than 30 days.

1. All sewers shall be laid accurately to the line and grade designed by the ENGINEER. The sewers will be tested for alignment by shining a light through the pipe at a manhole and viewing the light from an adjacent manhole. Any section of sewer in which a light cannot be seen from one manhole to the next shall be corrected to the satisfaction of the ENGINEER to pass this test.

1. The CONTRACTOR shall have tests of pipe strength made by an independent testing laboratory. Tests of up to 4 lengths of sewer pipe per hundred lengths may be required to show compliance with the Specifications, All pipe delivered to the job site shall be accompanied with a manufacturer's certificate of compliance to the Specifications.

- 1. The CONTRACTOR shall submit shop drawings, or data sheets for all castings, steps and manholes.
- 2. The CONTRACTOR shall submit certification letters for all pipes. All letters must contain the following: Contractors name, project name, township name, current date, certification of pipe provided and letterhead

A. Reinforced concrete pipe and manhole tees shall be no less than the latest revision of ASTM C76, with the class designation as shown on the Plans or in the Proposal.

### B. Concrete pipe shall have tongue and groove gasketed premium joints.

C. Corrugated steel pipe shall meet the requirements of AASHO M-190 for coated pipe latest revision. Minimum gage thickness shall be as shown on the Plans.

### 2.02 REINFORCED CONCRETE MANHOLES

- A. Manholes shall conform to the current ASTM Specifications for precast reinforced concrete Manhole Sections, 3.03 serial designation C478. Manhole section joints shall conform to ASTM Designation C990. All cones shall be eccentric with an offset step configuration. Concrete adjustment rings or riser rings shall not be used for adjusting the height of the structure.
- B. All manhole component parts shall have the name of the manufacturer stenciled on the inside. The lettering or logo shall be a minimum of 4 inches high.

A. Mortar for plastering manholes and drainage structures shall be made of one part Portland cement and two

- A. Brick for brick and mortar structures shall conform to the current ASTM Specification C32. Block for block and mortar structures shall conform to the current ASTM Specification C135.
- B. The concrete block masonry used to construct manhole and catch basin walls shall be solid curved blocks with the inside and outside surfaces curved to the required radii. The blocks shall have tongue and groove or other approved type of joint at the ends so that the units interlock to form a strong, rigid structure. Curved blocks shall have the inside and outside surfaces parallel.
- C. The block shall not exceed 18 inches in length or 8 inches in depth (height). No block shall be less than 6 inches in width (thickness). All blocks in one structure shall be of the same height dimension. The blocks shall be designed for length so that only full-length or half-length blocks are required to lay the circular wall of any one
- D. Blocks intended for use in the cones or tops of manholes and catch basins shall have such shape as may be required to form the structure as shown on the Plans with inside and outside joint not to exceed 1/4-inch in

### 2.05 STRUCTURE FRAMES AND COVERS

2" X 1/4" BAR RING BENT IN FIELD

TO FIT PERIMETER

OF END SECTION .

A. Structures frames and covers shall weigh not less than 350 lbs. Each frame and cover shall have machined bearing surfaces and shall be suitably notched for convenient removal of the cover. Each solid manhole cover shall be marked Storm Sewer with letters integrally cast into the cover.

- B. Frames and Covers shall be as follows:
- 1. For use on manholes: East Jordan 1040Z, with Type B cover lettered "STORM SEWER", or equal. Structures 24-inches in diameter shall have the 1045 Z frame.
- 2. For use on drainage structures in paved areas: East Jordan 1040Z, with Type M1 cover, with "DUMP NO WASTE" lettering and trout logo.
- 3. For use on drainage structures in curbed areas: East Jordan 7045 or 7065, with "DUMP NO WASTE" lettering and trout logo.
- 4. For use on drainage structures in landscaped areas: East Jordan 1040Z, with 1040 N 7", with "DUMP NO
- C. All frames and covers shall be coated by the manufacturer with coal tar pitch varnish or other asphaltum
- coating reviewed by the ENGINEER.
- D. All covers for drainage structures shall have storm drain markers affixed to the nearest available flat surface. The storm drain markers shall be manufactured by Das Manufacturing and shall be #SDR "No Dumping. Drains to River." The storm drain markers shall be installed per the manufacturer's recommendations.

### 4' SOD STAKED IN PLACE MDOT STD. IV-86C END SECTION RIPRAP (SIZE AS SHOWN ON PLANS) PIPE BEDDING -NONWOVEN GEOTEXTILE FABRIC OR EQUAL) 3000 PSI CONCRETE EXTENT OF RIPRAP SHALL BE AS SHOWN SECTION A-A HERE OR AS SHOWN ON PLANS, WHICH-

### 2.06 MANHOLE STEPS

A. Steps shall be plastic coated steel. They shall be M.A. Industries PS1-PF for precast manholes, PS1-B for block manholes, or equal.

### DRAINAGE STRUCTURES

- A. All manholes and catch basins shall be precast unless otherwise specified.
- B. Manhole and catch basin bottoms shall be concrete and top of slab shall have a troweled finish.
- C. Upon approval by the ENGINEER, the manhole and catch basin walls may be constructed of concrete block masonry or concrete manhole pipe conforming to the requirements of the specifications previously listed. Construction shall be in accordance with the details for Catch Basin and Storm Sewer Manhole shown on the
- D. A plaster coat of mortar 1/2-inch in thickness shall be applied to the inside and outside surface of all manholes and catch basins constructed with concrete block masonry or sewer brick. The inside coat of mortar shall be applied in a smooth, neat workmanlike manner.
- E. Final adjustment of the top of manholes and catch basins, so that the manhole or catch basin cover is at finished elevations as shown on the Plans or meets the finished surface, may be accomplished with sewer brick conforming to the previously listed Specifications. The total height of brick for this purpose shall not exceed 9 inches. The total chimney height shall not exceed 18 inches.
- F. All block and brick masonry units shall be laid in a full bed of mortar. The inside joints of the block masonry construction shall be tooled in a neat and workmanlike manner.

### 3.00 EXECUTION

### EXCAVATION AND BACKFILL

- A. All excavation and backfill 12 inches above the crown of pipe shall conform to Section 2.04, Earthwork of these specifications.
- B. The trench shall be backfilled closely behind the pipe laying. Unless otherwise directed or permitted by the ENGINEER, the backfilling shall follow and be completed to the top of the trench within four pipe lengths behind pipe laying.

- A. Concrete pipe shall be laid on a compacted granular material placed on the bottom of the trench to a depth of not less than 4 inches. Where indicated on the Plans or required by the ENGINEER, concrete encasement or cradle shall be used.
- B. For all pipes, compacted aggregate material shall be placed at the sides of the pipe in 12-inch lifts and cover not less than 12 inches above the crown of the pipe.
- C. "Granular Material" shall be MDOT class II, placed in not more than 6-inch layers and compacted to not less than 90% standard density.

### PIPE INSTALLATION

- A. All pipe shall be laid true to the required lines and grades. All trenches when pipe laying is in progress, shall be kept dry, and all pipes and fittings shall be uniformly supported on a properly trimmed bedding with holes at each joint to receive bells. All pipe shall be laid with bells uphill.
- B. The grade as shown on the profiles is that of the pipe invert and that to which the work must conform. The grade shall be kept by laser or other tools which shall be furnished by the CONTRACTOR at his expense. Each pipe shall be laid accurately to the line and grade as shown on the Plans and in such manner as to form a close concentric joint with the adjoining pipe and prevent sudden offsets of the invert. The interior of sewers shall, as the work progresses, be cleaned of all dirt, cement, debris and other superfluous materials of every description. Bulkheads shall be used to keep foreign materials out of the open end of the sewer
- C. The location of the piping as shown on the Plans has been determined to avoid, insofar as possible, interference with trees or structures or fixtures above ground and other underground mains, services, utilities or structures. Any change in location or alignment of piping, which may be found more feasible or practicable as the work progresses, shall be made by the CONTRACTOR, as the ENGINEER may direct.
- D. All pipe shall be carefully lowered and moved into position in trench or vault in a controlled manner such as will prevent damage to the pipe and any coatings or lining. An excessive amount of scratching on the surface of the concrete pipe will be considered cause for rejection.
- E. All cutting of the pipe shall be done in a neat workmanlike manner with the least amount of waste and without damage to existing or new lines. A fine toothsaw, tubing cutter or similar tool may be used to cut concrete pipe. Cuts must be square. Ragged edges shall be removed with a cutting tool or file.
- F. Breaks in pipe or joints shall be repaired to the satisfaction of the ENGINEER and at the expense of the

### CONNECTIONS TO EXISTING MANHOLES

- A. When a sewer is connected to an existing manhole, a hole adequate to receive the new pipe shall be cored
- B. If the existing manhole is of brick construction, a single rowlock of brick shall be turned over the new pipe and the existing manhole brick work shall be cleaned, pointed and given a 1/2-inch mortar coat on the outside surface.
- C. For connections to existing precast reinforced concrete manholes, a hole shall be cored into the concrete manhole wall to receive the pipe. Reinforcing steel shall not be cut out shall be bent and replaced in the area that is to be patched. A form shall be constructed over the area of pipe penetration. The formed area shall then be filled with concrete.

PCT February 2008

D. Closure of the manhole wall shall be made watertight using concrete.

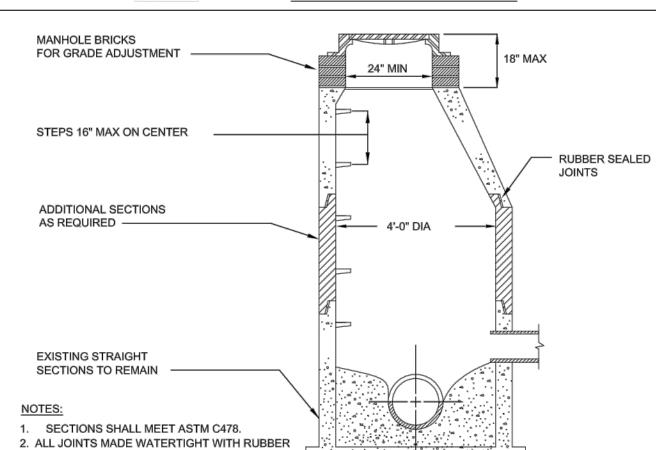
A. Animal grates shall be required on all endsections greater than 12-inch diameter.

PRECAST CONCRETE ALL JOINTS MADE WATERTIGHT WITH APPROVED MASTIC MATERIAL AND MAXIMUM DEPTH OF 2'-0" DIA. CURB INLETS TO BE 5'-0". 3. ALL CURB INLET COMPONENT PARTS SHALL HAVE THE NAME OF THE MANUFACTURER STENCILED ON THE INSIDE. THE LETTERING SHALL BE A MINIMUM OF 4" HIGH. SECTION B-B SEE STRUCTURE SCHEDULE FOR TYPE OF FRAME MANHOLE BRICKS FOR GRADE ADJUSTMENT. PRECAST CONCRETE - RUBBER SEALED JOINTS \_2'-0" DIA. PRECAST INTEGRAL BASE SHALL BE MINIMUM 3000 PSI REINFORCED CONCRETE SECTION A-A 2' DIAMETER INLET AFFIX TO SURFACE ON OR NEAR ALL



STORM DRAIN MARKER

- ANIMAL GRATING. (ALL BARS ARE 3/4"Ø)



GASKET JOINTS 3. REMOVE CONE, ADD STRAIGHT SECTIONS AS REQUIRED AND REPLACE CONE ADD MANHOLE STEPS AS NECESSARY

ADJUSTMENT

5. ADD ADJUSTMENT RINGS FOR RIM GRADE MANHOLE & CATCH BASIN RECONSTRUCTION DETAIL

### RUBBER STEPS 16" MAX ON CENTER. SEALED \_\_\_ JOINTS FOR PRECAST BOTTOM USE MORTAR AS INDICATED -PRECAST BOTTOM OR POURED IN 2' SUMP PLACE BOTTOM SHALL BE 3000 PSI, - 8" MIN. 28 DAY STRENGTH CONCRETE W/4X4 WIRE MESH. SECTION A-A 4' DIAMETER CATCH BASIN PRE-CAST CONCRETE MANHOLE SECTIONS SHALL MEET ASTM C478. 2. ALL JOINTS MADE WATERTIGHT WITH RUBBER GASKET JOINTS 3. CONE TO BE ECCENTRIC TYPE ALL MANHOLE COMPONENT PARTS SHALL HAVE THE NAME OF THE MANUFACTURER STENCILED ON THE INSIDE. THE LETTERING SHALL BE A MINIMUM OF 4" HIGH.

SECTION B-B

Municipal de la constitución de

24" MIN.

SEE STRUCTURE

SCHEDULE FOR

TYPE OF FRAME

PRE-CAST CONCRETE MANHOLE

4. ALL MANHOLE COMPONENT

PARTS SHALL HAVE THE

STENCILED ON THE INSIDE.

THE LETTERING SHALL BE

A MINIMUM OF 4" HIGH.

MANHOLE BRICKS FOR

GRADE ADJUSTMENT.

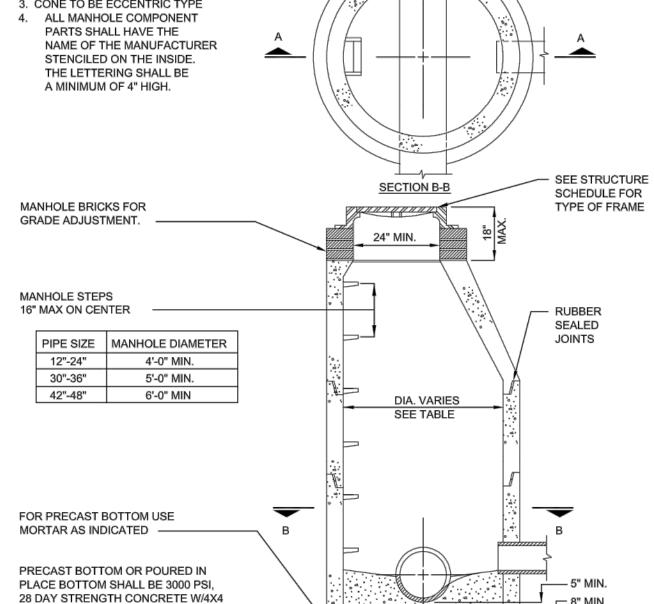
SECTIONS SHALL MEET ASTM C478.

RUBBER GASKET JOINTS.

CONE TO BE ECCENTRIC TYPE

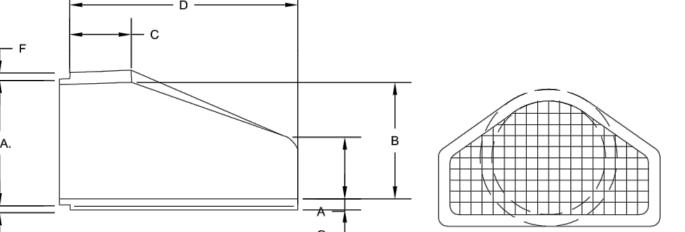
ALL JOINTS MADE WATERTIGHT WITH

NAME OF THE MANUFACTURER



STORM SEWER MANHOLE

WIRE MESH. -



Pittsfield Charter Township 6201 W. Michigan Ave. Ann Arbor, MI 48108-9721 48108-9721 Tel. 734.822.3101 www.pittsfield-mi.gov

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UPDATES

**UPDATES** 

Revision

File Name: ST-01

Permit-Seal

Client/Project

PITTSFIELD TOWNSHIP

Pittsfield Township, Michigan

STORM SEWER DETAILS

Scale

NOT TO SCALE

AND SPECIFICATIONS

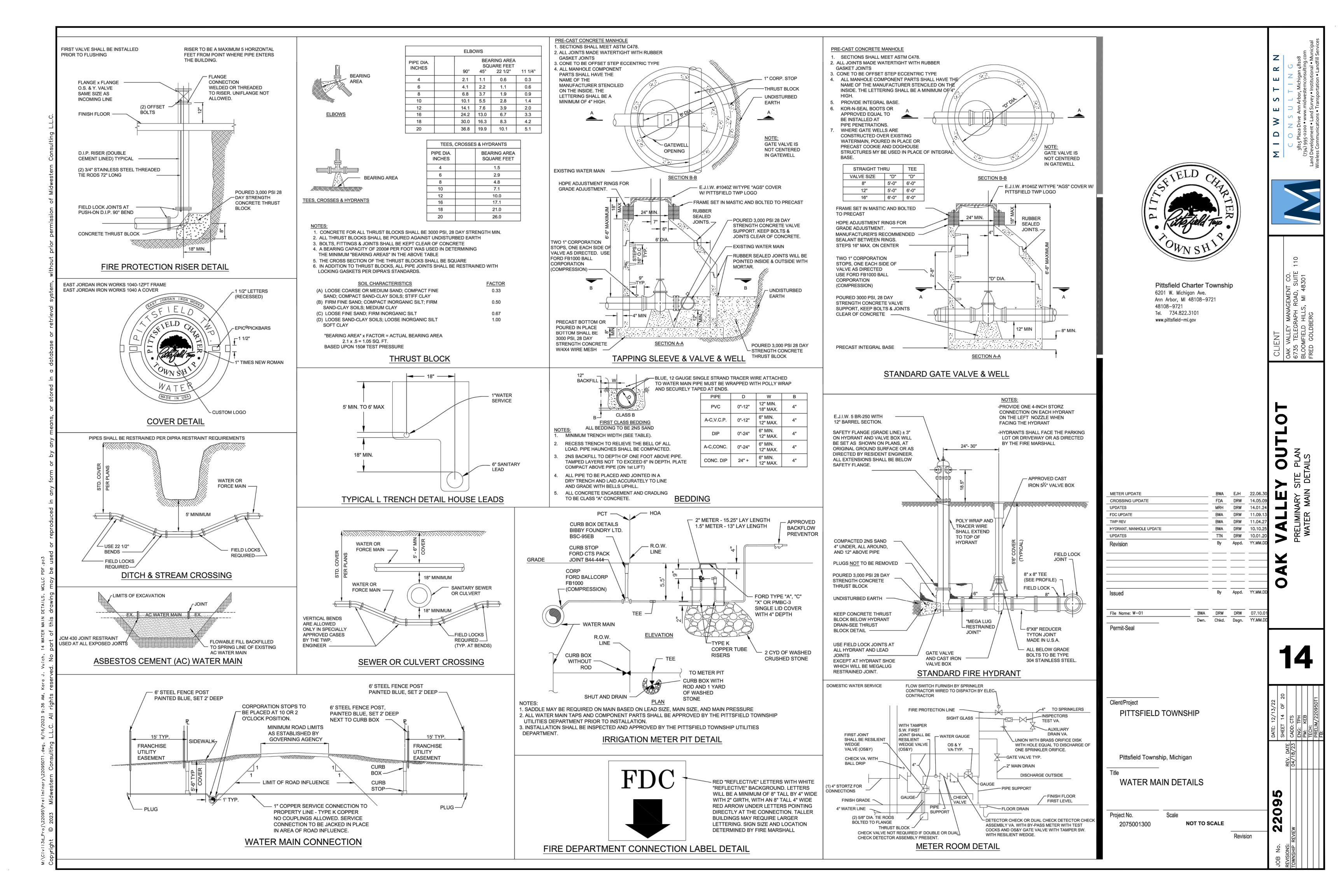
2075001300

14.01.2 12.08.09 11.04.2 10.01.2 By Appd. YY.MM.D

Revision

DIA A B C D E F G 12" | 5" | 13" | 45.5" | 72" | 24" | 2" PLACE SO 15" 7" 16" 43.5" 72" 30" 2.25" 2.25" RIP-RAP (SIZE 18" | 11" | 19" |41.5" | 72" | 36" | 2.5" | 2.5" AS SHOWN ON 24" | 12" | 25" | 29" | 72" | 48" | 14" | 31" | 19" | 72" | 60" | 3.5" | 3.5" 3 X O.D. OF PIPE (MIN.) 17" | 37" | 34.5" | 96" | 72" | 4" | 4" OR AS SHOWN ON PLANS NIMAL GRATE SHALL BE | 42" | 22" | 43" | 32.5" | 96" | 78" | 4.5" | 4.5" | 48" 24" 49" 23.5" 96" 84" ENDSECTIONS GREATER THAN 12 INCHES IN DIAMETER FLARED END SECTIONS SHALL BE MANUFACTURED TO THE CLASS SPECIFICATIONS AS THE PIPE ITSELF. PLAN VIEW

3. RIPRAP THICKNESS AS SHOWN ON PLANS. STANDARD END SECTIONS FOR PRECAST CONCRETE END SECTION AND RIPRAP DETAIL



1 DESCRIPTION

A. The CONTRACTOR shall furnish all labor, materials, and equipment required to construct a water main and necessary appurtenant work as herein specified. The water main shall be installed in the locations as shown on the Plans and shall meet all acceptance

### 02 NOTIFICATION

- A. CONTRACTOR shall notify the ENGINEER and the Pittsfield Township Utilities Department at (734) 882-2110, 24 hours prior to flushing or chlorination of the water main.
- B. CONTRACTOR shall schedule bacteriological testing with the ENGINEER 48 hours prior.

main at the far end of the project not connected to the existing system

close of the test, all taps shall be satisfactorily plugged with brass plugs.

C. CONTRACTOR shall notify the ENGINEER and the Pittsfield Township Utilities Department 48 hours prior to connecting to an

### 1.03 SUBMITTALS

A. The CONTRACTOR shall submit shop drawings or data sheets for all pipe, manholes, manhole castings, pipe to manhole connections, valves, hydrants and the B-1 Poly Pig. The Contractor shall submit a certification letter for all pipe proposed on the project. The letters shall contain the following: Contractor name, project name, Township name, current date, certification of pipe provided and letterhead of the certifying company.

### 04 TESTING A. General

- 1. CONTRACTOR shall furnish all equipment and personnel to conduct system acceptance tests as specified herein. All tests shall be conducted under the supervision of the ENGINEER. All water mains, branches and valves shall be subject to cleaning with a poly-pig, hydrostatic pressure testing, disinfection and bacteriological testing. No acceptance tests shall be conducted until the water main has been installed and backfilled for not less than 30 days. A copy of all test results shall be furnished to the
- 2. Hydrostatic pressure testing must be performed in accordance with ANSI/AWWA C600. Disinfection and bacteriological testing must be performed in accordance with ANSI/AWWA C651.
- 3. CONTRACTOR shall furnish all material and labor to provide for an acceptable full size blow-off to flush the poly-pigs out of the
- 4. Should the results of any test fail to meet the criteria established in this Specification, the CONTRACTOR shall, at his own expense, locate and repair the rejected section and retest until it is within the specified allowance.
- 5. Only Pittsfield Township personnel or the CONTRACTOR under direct supervision of Pittsfield Township personnel may fill or flush
- B. Preparation
- 1. After the pipe has been laid and backfilled as specified, the CONTRACTOR shall fill the line, or a valve section thereof, to be tested with water in such a manner as to expel all air from the pipe. This may be done through fire hydrants at the high points; or, if no hydrant is available at such point, the CONTRACTOR shall make the taps necessary to accomplish the expulsion of all air. At the

### C. Sequence

1. All water mains connected to an existing water system shall be flushed, swabbed, chlorinated and bacteriological tested prior to pressure testing. The sequence for acceptance testing shall be:

- a. Flushing with approved B-1 Poly-Pig
- b. Chlorination c. Flushing
- d. Bacteriological Testing e. Pressure Testing
- 2. Where mains can be totally isolated from the existing water system with airgaps, pressure testing shall precede chlorination and bacteriological testing. The sequence for acceptance testing shall be:
- a. Pressure Testing
- b. Connect to System c. Flushing with approved B-1 Poly Pig
- d. Chlorination
- e. Flushina f. Bacteriological Testing
- 3. If a hydrostatic pressure test fails, the chlorination and flushing process must be repeated after repairs to the system are completed.

1. All flushing will be conducted by the TOWNSHIP with clean potable water until the water runs clear.

### E. Chlorination

1. All new mains and pipe or any existing mains contaminated by the CONTRACTOR shall be chlorinated to a minimum residual water shall be allowed to stand in the mains for 24 hours. The end of the 24-hour period the chlorinated water at all parts of the mains shall show a free available chlorine residual of not less than twenty-five (25) parts per million. If less than twenty-five (25) parts per million residual is shown at the end of the first 24 hours period, additional chlorine shall be added until a residual of not less than twenty-five (25) parts per million at all parts of the system is shown after a subsequent 24 hour period. The chlorinated water shall then be removed from the mains and the mains flushed with potable water for bacteriological testing. No flushing shall take place between the two required bacteriological testing.

### . Bacteriological Testing

- 1. The Pittsfield Township Utilities Department will take bacteriological samples of the water in the mains for analysis at two different times. The first samples will be taken 24 hours after the mains have been satisfactorily chlorinated, flushed and filled with potable water. The second sample will be taken 24 hours later. Each sample will be incubated for 48 hours. No flushing shall be done during or between tests, unless supervised and approved by ENGINEER. Two sets of safe consecutive bacteriological samples, collected at least 24 hours apart, must be obtained before placing the water main in service.
- 2. The CONTRACTOR shall provide a sufficient number of corporation cocks and copper tubing for taking samples. Samples shall not be collected from hoses or fire hydrants.
- 3. Bacteriological testing must begin on Mondays to allow Pittsfield Township personnel and the testing laboratory a full work week to conduct the testing.

### G. Hydrostatic Pressure Testing

- 1. The CONTRACTOR shall pressure test sections of water main as sections of 2,000 feet or less unless otherwise authorized by the ENGINEER. When permitted to test lengths in excess of 2,000 feet, only the allowable leakage for 2,000 feet will be permitted.
- 2. All water mains shall be subjected to a hydrostatic pressure of 150 psi based on the elevation of the lowest point in the system. The main shall be maintained under the test pressure for a minimum continuous period of two (2) hours by pumping potable water into the line at frequent intervals. The volume of water so added shall be measured and considered to represent the leakage from the main. No pipeline installed will be accepted until the leakage measured is less than 0.092 gallons per inch diameter of the pipe per 1 hour per 1,000 feet.
- 3. In the event that the leakage exceeds the specified amount, the main shall be carefully inspected for leaks and repaired as necessary. Any cracked or defective pipe, fittings, valves or hydrants discovered shall be removed and replaced with sound material and the test repeated to the satisfaction of the ENGINEER.
- 4. If the CONTRACTOR chooses to pressure test against an existing valve he assumes the responsibility of meeting the leakage requirements. The CONTRACTOR may at his discretion provide a physical break and cutting in sleeve for pressure testing.
- 5. Temporary connections (jumpers) between existing water mains and the newly constructed system for testing purposes, shall include a reduced zone backflow preventer to prevent backflow and possible contamination of the public water.

### H. Material Tests

1. The CONTRACTOR shall have test of pipe and strength made by an independent testing laboratory. Tests of up to 4 lengths of water main per hundred lengths may be required to show compliance with the Specifications. All pipe delivered to the job site shall be accompanied with a manufacturers certificate of compliance to the specifications.

### 00 PRODUCTS

A. All products shall be consistent with the current component part submittal sheet posted on the Township website.

### 11 PIPE AND FITTINGS

A. Ductile-iron pipe water main shall meet all the requirements of the latest revision of ANSI/AWWA C151/A21.51. Pipe shall be furnished in eighteen-foot or twenty-foot lengths, unless otherwise required. All joints, to include joints for fittings, valves and hydrants, must be of the push on joint type and compatible tyton joint gaskets. Ductile iron pipe must be designed in accordance with the latest revision of ANSI/AWWA C150/A21.50 to meet requirements for Pressure Class 350.

- B. Ductile iron pipe and fittings shall be double-cement lined with an approved bituminous seal coat in accordance with ANSI/AWWA C104/A21.4
- C. Ductile iron fittings shall meet all the requirements of the latest revision of ANSI/AWWA C110/A21.10 for full body fittings and ANSI/AWWA C153/A21.53 for compact fittings for a minimum working pressure of 250 psi and be of the push-on joint type. Plugs, where shown on the plans, shall be solid mechanical joint plug type.
- D. Restrained mechanical joints of the wedge action type shall use a follower gland and shall include a restraining mechanism which, when activated, impart multiple wedging action against the pipe, increasing its resistance as the pressure increases. Twist off nuts shall be used to insure proper actuating of the restraining device. Restrained mechanical joints for ductile iron pipe shall be Megalug, Series 1100, or approved equal. Mechanical joints shall be in conformity with the requirements of the latest revision of the ANSI AWWA C111/A21.11. Bolts and nuts must be type 304 stainless steel.
- E. Push-on joints shall meet all requirements of ANSI/AWWA C111/A21.11. Push-on joints shall consist of a ductile-iron bell provided with a recess to receive a circular molder rubber gasket to effect the joint seal. A rubber gasket and sufficient lubricant to assemble the joint shall be furnished with each joint. The lubricant shall have no deleterious effect upon the color, taste or odor of potable water and shall not be corrosive to either the pipe or gasket. Pipe furnished with push-on type joints shall be equal in strength and leak tightness to pipe furnished with mechanical joints as specified when installed under identical conditions, and shall meet all other requirements of these specifications. In addition to the above requirements, the gasket and lubricant shall conform to the latest revision of ANSI/AWWA C111/A21.11. When it is necessary to utilize a locking mechanism for a push-on joint upstream or downstream of a restrained mechanical joint, field-lok gaskets or equal shall be utilized and shall be used in conformance with DIPRA Standards for restraint distance from a restrained mechanical joint fitting.
- F. All pipe and fittings shall be manufactured in the United States of America.
- G. The ENGINEER shall witness the delivery and unloading of all pipe and collect the appropriate manufacturer's certificate of compliance per Section 1.04 of this Specification.

A. All valves installed under this Specification shall conform to the applicable requirements of ANSI/AWWA C500, C504 and C509 standards governing construction materials and workmanship. Each valve shall carry the name or trademark of the manufacturer. All valves shall have operating nuts that turn to the right (clockwise) to open.

### B. Resilient-Seated Gate Valves

- 1. Resilient seated gate valves shall conform to the applicable requirements of ANSI/AWWA C515. Valves shall have a minimum working pressure of 250 psi. The gate shall be ductile iron encased in a bonded synthetic rubber to form resilient seating surfaces. Stem shall be bronze with a non-rising design and double o-ring packing. Joints shall be
- 2. Resilient Seated Gate Valves shall be manufactured by American Flow Control or Clow.

### C. Tapping Sleeves and Valves

- 1. Tapping sleeves shall be full length of heavy-duty stainless steel construction designed for use with the type of pipe to be tapped. Tapping sleeve flange and body shall be type 304 stainless steel. Bolts and nuts shall be 304 stainless steel. Gasket shall be full circumferential SBR compounded for water service. Tapping sleeve shall contain a test plug to assure seal prior to tapping. Tapping sleeve shall be JCM Industries 432; Romac Industries SST, Ford FAST, Powerseal 3490AS; Dresser 630 or equal.
- 2. Tapping valves shall meet the specifications for gate valves except that the valve shall have a flange compatible with the
- 3. The tapping sleeves and valves shall be subjected to a hydrostatic pressure of 200 psi. The sleeves and valves shall be maintained under pressure for a minimum continuous period of 5 minutes by pumping potable water into the sleeve. Upon any visual leakage observed by the ENGINEER, the tapping sleeve and valve shall be removed and replaced, and the test repeated at the CONTRACTOR's expense to the satisfaction of the ENGINEER.

### D. Corporation Stops

1. Corporation stops used for insertion into mains shall be ball valve type. All stops shall have no lead brass bodies, keys, stem washers and nuts. Inlet threads shall conform to the latest revision of AWWA C800. The outlet connection shall be of the compression type to receive copper service pipe.

### E. Valve Boxes

1. Valves boxes shall be 5-1/4-inch and be of cast-iron construction. They shall be of three-piece, screw-type adjustment design. All valve boxes shall be installed flush with the top of the proposed site grade. Cover shall be designed to be removed easily to provide access to the valve. The base shall not rest upon the valve assembly. Valve boxes shall be Tyler 6860 Item DD with number 6 base, or equal.

### F. Valve Extensions

1. All gate valves with operating nuts at a distance greater than 6.5 feet below ground surface shall be provided with an

extension stem. The length of the extension stem shall reach within 6.5 feet of the ground surface. Details of the extension system and method of installation shall be approved by the ENGINEER prior to installation.

### G Post Indicators and Valves

- 1. Post indicators, when specified, shall be American Flow Control series A240 or Clow series 2945A with aluminum plates indicating OPEN and SHUT. Post indicators shall open left.
- ow Control Model 2500 or Clow model F-6120. All valves shall open left.
- 3. Post indicators and their corresponding valves must be made by the same manufacturer. 4. Bollards must be placed to protect post indicators, except as specified by the ENGINEER.
- 5. Bollards shall be 4-inch diameter galvanized schedule 40 steel posts 36 to 48 inches high with minimum depth of 24 inches. The posts shall be set in and filled with 3000 psi concrete. Bollards protecting hydrants and

### 2.03 GATEWELLS

- A. Gatewells shall conform to the latest revision of ASTM C478 for Precast Reinforced Concrete Manhole Sections. Section joints shall be rubber gasketed and shall conform to ASTM C990. Cone sections shall be eccentric, with an offset step configuration.
- B. All gatewell components shall have the name of the manufacturer stenciled on the inside. The lettering shall be a minimum of 4-inches high.
- C. Gatewells constructed over an existing water main shall have a doghouse mudded to an 8-inch thick cookie. All other gatewells shall have precast integral base sections.
- D. Mortar for masonry or plastering outside of gatewells shall be made of one part of Portland Cement to two parts fine aggregate. Mortar materials and mixing shall correspond, in general, to those for concrete. All openings in gate wells shall be closed with brick and mortar in a manner that will make them watertight.
- E. Gatewell steps shall be reinforced polypropylene coated steel. They shall be M.A. Industries models PS1-PF or PS1-B, or

### 2.04 GATEWELL FRAMES AND COVERS

- A. Gatewell frames and covers shall weigh not less than 350 lbs. Each frame and cover shall have machined bearing surfaces and shall be suitable notched for convenient removal of the cover.
- B. Frames and covers shall be East Jordan Iron Works Model 1040Z frame with 1040 A cover. Each cover shall have the Pittsfield Township logo and the letters "PITTSFIELD TWP WATER" cast integrally into the cover.
- C. All frames and covers shall be coated at the place of manufacturer with coal tar pitch varnish or other asphaltum coating

### 2.05 GATEWELL CONNECTIONS

- A. Water pipe to gate well connections shall be through a watertight flexible pipe-to-manhole connector, which shall be securely clamped into a core-drilled port. Pipe ports shall be core-drilled at the point of manufacturer and shall be accurately located within 1/2-inch of the proposed water main centerline. Flexible pipe-to-manhole connectors shall meet the requirements of ASTM C923 and shall be NPC, Kor-N-Seal, or equal.
- B. All non-rubber components including wedges, bands and pipe clamps shall be stainless steel.

### 2.06 GATEWELL ADJUSTMENTS

- A. All final grade adjustment of gatewell cover and frame assemblies shall be completed utilizing injection molded High Density Polyethylene (HDPE) adjustment rings as manufactured by Ladtech, Inc., or approved equal. The adjustment rings shall be manufactured from polyethylene plastic meeting the requirements of ASTM D4976. Brick adjustments are not
- B. All adjustment for matching road grade shall be made utilizing a molded indexed slope ring.
- C. Each adjustment ring shall be sealed with a 3/16 to 1/4-inch bead of butyl rubber sealant per the manufacturer's instructions. Sealant shall meet the requirements of ASTM C990.
- D. All castings and adjustment rings shall be securely fastened to the cone of the structure with four 3/8-inch threaded rods. The rods shall be galvanized or stainless steel anchored to the structure with Redhead Trubolt concrete anchors, or equal. Stainless steel or galvanized nuts and washers shall be used to attach the casting.
- E. When the depth of the gate well requires an adjustment greater than the maximum allowed, the CONTRACTOR shall provide additional pre-cast gate well barrel sections required to maintain acceptable chimney heights.

### 2.07 HYDRANTS

A. Fire hydrants shall comply with the latest revision of ANSI/AWWA C502. Hydrants shall be compression type to open with the pressure. They shall have a 5-1/4" valve opening and 6" mechanical joint inlet. Hydrants shall have two 3-1/2" (4.05" O.D.) pumper connections with National Standard 7-1/2 threads per inch. All hydrants shall have City of Ann Arbor standard thread pattern.

- B. Fire hydrants shall have an inside barrel dimension of not less than 7.375" I.D. from top to bottom. The 1-1/8" pentagon operating nut shall open left (counter clockwise).
- C. All nozzles shall be on a removable head with a flange so that they may be rotated by changing the position
- D. Hydrant shall be fully bronze mounted, including top of the operating stem where it passes through the double o-ring seal in the bronze packing gland. The forged operating stem in the base and the valve seat shall also be of bronze. The molded valve shall be of composition rubber and the cast iron valve clamps shall be packed with o-ring seals and held tight to the stem by a threaded bronze hex retainer ring and threaded bronze locknut, anchored with set screws.
- E. Hydrant shall be designed for 150 psi working pressure and tested to 300 psi. Those portions of the hydrant above grade shall have two coats of red enamel. All unpainted surfaces shall have two coats of coal tar pitch
- F. The hydrants shall be EJIW WaterMaster 5BR-250 with mechanical joint connections and break flange barrel with standard head.
- G. Hydrant bolts located below grade shall be type 304 stainless steel
- H. All hydrants shall have a 4" Harrington Integral Hydra-Storz (HIHS) adaptor. The HIHS shall meet the requirements of AWWA C502 regarding material and pressure testing. Stortz nozzle shall have a brass metal face and hard anodized ramps and lugs. The aluminum finish shall be hardcoat anodized to Mil-A-8625f, type 3 dark gray. The adapter shall be made from forged or extruded 6061-T6 aluminum.
- I. The blind cap shall have hard anodized aluminum Storz ramps and lugs, made of forged or extruded 6061-T6 aluminum. the cap shall be equipped with suction seal. The cap shall be connected to the adapter or the hydrant with 0.125 vinyl coated aircraft cable.
- J. Fire hydrant extensions shall be manufactured by the hydrant manufacturer for use with the model hydrant
- K. Hydrants adjacent to truck routes on commercial developments shall be protected by bollards.

### 2.08 SERVICE LEADS

A. Pipe for service leads 1-inch to 2-inch shall be soft annealed Type K copper. Service leads 4-inch to 8-inch shall be Pressure Class 350 Ductile Iron, Double cement lined.

### B. Curb Stops

1. Curb stops used for service connections shall be ball valve type. All parts shall be no lead brass. Both the inlet and outlet connections shall be of the compression type to receive copper service pipe. Curb stops shall be consistent with the most current shop drawing checklist posted on the Township website.

### C. Curb Boxes

1. Curb boxes shall be the Bibby Screw Style V010 with S169 top, V201 bottom, V223 extention, and V240 water cover . All curb boxes shall be coated inside and out with a tar base enamel. The minimum bury shall be 5'-0" (60") and the maximum 6' (72"). Curb boxes shall be consistent with the most current shop drawing checklist posted on the Township website.

- 1. Couplings used for service connections shall be located outside the pavement and more than 10 feet from any building wherever possible. They shall have a three part union, and both connections shall be of the compression type to receive copper service pipe. All parts shall be no lead brass..
- 2. All service connections between two copper service pipes (two-inch or less in diameter) located under the pavement or within 10 feet of a building shall be connected using wrought copper, solder-sweat type couplings conforming to ASME B16.18 or ASME B16.22. Fittings shall bear made in USA labels. Joining of copper piping shall be a solder-sweat connection using lead free Silfos. The use of 95-5, Tin-Antimony or equivalent solders will not be allowed.

### 2.09 TRACER WIRE

A. Tracer wire to be used on open cut pipe shall be AWG #12 single strand copper with blue 30 mil HDPE insulation. Connections shall be made using 3M DBR-6 wire connectors, or equal.

### 2.10 POLYETHYLENE ENCASEMENT

- A. All ductile iron pipe and fittings must be polyethylene encased. In addition, the initial 24-inches of copper service lead must be encased from the corporation stop. Polyethylene encasement must be manufactured in accordance with the requirements of the latest revision of ANSI/AWWA C105/A21.5.
- B. Polyethylene Encasement shall be black linear low-density polyethylene with a minimum thickness of 8 mils.
- C. The wrap shall overlap the joint by 12 inches to either side and be secured to the pipe with polyethylene adhesive tape.

### 3.00 EXECUTION

### 3.01 EXCAVATION AND BACKFILL

A. All excavation and backfill shall conform to the Earthwork specification.

### 3.02 PIPE INSTALLATION

protected by providing:

- A. The installation of ductile iron water main must conform to the requirements of ANSI/AWWA C600.
- B. Any pipe damaged in transport or handling shall be rejected and removed from the site of the work.
- C. Before lowering in the trench, and while suspended, each pipe and fitting shall be inspected for defects. Defective, damaged or unsound pipe shall immediately be removed from the construction site. The interior of each pipe shall be inspected for cleanness and cleared of all dirt and foreign matter before being lowered

D. In handling and placing ductile iron pipe and fittings, no metal shall be used in contact with the inside of the

- pipe to fit or support the pipe. The pipe shall be moved only through the use of belt slings or automatic release type pipe tongs. Care shall be taken not to injure the pipe or pipe coating, and no damaged or imperfect pipe shall be used in the work except that minor damage to pipe coating may be repaired subject to the review of the ENGINEER.
- E. Unless otherwise directed, pipe shall be laid with bell ends facing in the direction of laying. After a length of pipe is placed in the trench, the spigot shall be centered in the bell of the adjacent pipe; the pipe shoved into position and brought to a true alignment. It will then be secured with sand backfill tamped under and on each side of the pipe, except at bell holes. No earth or other foreign matter shall be allowed to enter the joint
- F. All excavation and backfill above the pipe shall conform to specifications under Earthwork and as shown on the Drawings.
- G. A minimum of 18-inches vertical clearance shall be provided between the water main and any existing underground facility, unless otherwise approved by the ENGINEER. Whenever a main is installed under any existing utility line such as gas, buried electric power, telephone line, sewer or water, provisions shall be made to properly support or distribute any concentrated load to avoid settlement and possible failure of either main. Such provisions shall consist of concrete bedding of the main, complete concrete encasement, or some other method as shown on the plans. Water mains passing under sewers, in addition, shall be
- 1. A vertical separation of at least 18-inches between the bottom of the sewer and the top of the water main.
- sewer about the water main; i.e., a concrete saddle under the pipe with a span length extending to undistributed earth bearing.

2. Adequate structural support for the sewer to prevent excessive deflection of joints and settlement of the

- H. Water mains shall be installed at least 10 feet horizontally from any existing or proposed gravity sanitary or storm sewer, septic tank, or subsoil treatment system. The distance shall be measured edge to edge.
- I. In assembly of push-on or shove type joints, the bell socket recess and the gasket shall be wiped clean and the gasket placed properly in position. A thin film of lubricant shall then be applied to the surface of the gasket to come into contact with the entering pipe. The plain end of the entering pipe shall be cleaned and then entered and forced home to the base of the socket.
- J. Where necessary to cut pipe, cutting shall be done with approved tools and cut ends of pipe shall be square and regular. Cutting shall be done in a manner to avoid damage to lining and coating. Minor damage may be repaired subject to review of the ENGINEER.
- K. To prevent trench water from entering the pipe, joints, which for any reason may not be completed as the pipe is laid, shall be thoroughly packed with approved material, in a manner to make them watertight. Open ends of fittings shall be tightly closed with approved plugs and well packed, as shall the end of the last pipe
- are required by changes in grade or alignment or to plumb valve stems, the deflection at any bell and spigot joint shall not exceed that which will cause the spigot end of pipe to be away from home in the bell of the adjacent pipe a distance of 1/4 inch at the point of greatest opening.

L. Each pipe shall be laid accurately to the line and grade shown on the Plans. Wherever deflections at joints

- M. The deflection at any mechanical joint shall not exceed three-quarters of the maximum deflection recommended by the manufacturer or 3 degrees, whichever is more conservative of the joint used.
- N. The CONTRACTOR shall not be entitled to any additional compensation because depth is more than specified at certain locations or due to clearances at manholes, or due to unforeseen obstacles, or occasioned in order to avoid undue changes in grade.

O. Pipe shall be laid at depths to provide minimum cover of 5' - 6" over the top of the pipe unless otherwise noted on the Drawings or elsewhere in these specifications.

### 3.03 GATE VALVES AND WELLS

- A. All pre-cast section joints and lift holes shall be pointed and plugged, inside and outside, with mortar.
- B. Gate valves shall be of the size and installed at the location as shown on the plans. They shall be set square with the line of the main, and unless otherwise directed by the Township ENGINEER, all gate valves shall be set with stems plumb. At each side of gate valve, the CONTRACTOR shall furnish and install a 1-inch corporation stop on the main as shown on the Standard Details.
- C. All gate valves with operating nuts at a distance greater than 6.5 feet below ground surface shall be provided with an extension stem.

### 3.04 HYDRANTS

- A. Fire hydrants shall be constructed in accordance with the details shown on the plans. Finish grade level to center of nozzle caps shall measure between 24 and 30 inches. A maximum of one hydrant barrel extension and one operating stem extension may be used to accommodate changes in grade. Under no conditions shall extended hydrant have more than one coupling in the operating stem. Pumper connections shall point toward the street.
- B. Fire hydrants shall be installed with barrel vertical and properly based. Concrete thrust blocks shall be placed behind the hydrant, tee, and every bend. Care should be taken to insure the drain holes on the hydrant are not plugged by the thrust blocks. Hydrant shall be set in 1 yard of coarse gravel for drainage purposes. If ground water is encountered, the drain hole shall be plugged as directed by the manufacturer. The backfill shall be sand thoroughly tamped around the hydrant and valve box in 1 ft
- C. Fire hydrant and gate valve shall be set apart 24 inches. Gate valves and valve box shall be as specified under the valve paragraphs of this section
- D. Hydrant leads shall have a minimum of 5.5 feet of cover in all areas, including crossings through ditch
- E. Hydrants shall be carefully plumbed, braced and backfilled so they remain plumb.
- F. All grade, facing, and vertical alignment adjustment of hydrants shall be completed prior to pressure testing and charging of the hydrants.
- G. All hydrants shall be cleaned and painted with a rust inhibitive, oil base paint such as "rustoleum" or approved equal to the Township's color code prior to acceptance.
- H. The lubricant reservoirs in all hydrants having such construction shall be filled with a lubricant acceptable to the Michigan Department of Environmental Quality and recommended by the hydrant
- I. Backfilling around fire hydrants shall be carefully tamped sand in 12-inch layers from the centerline of the lead main to a height of 1-foot below finished grade.
- J. CONTRACTOR shall place burlap sack or equivalent material over the hydrant nozzles after K. Fire hydrant nozzles shall be aligned as required by the Township Fire Marshal.
- L. Fire hydrant extensions shall be provided as necessary so that the safety flange is located at or above surface grade.

### 3.05 TRACER WIRE

- A. Tracer wire shall be installed along the top of all water mains. For directional drilling, the tracer wire shall be installed at the same time as the pipe. For open cut construction, the tracer wire shall be installed at a height of not more than 6 inches above the main line pipe or service leads. Wire shall be extended to all hydrants, blow-offs, dead ends, service leads and post indicator valves. Tracer wire shall be brought to grade, leaving enough excess material to avoid loss or damage to the wire during construction and subsequent activities. Wire shall be trimmed to finish grade following completion of
- B. When tracer wire is to be run along short offsets (less than 20 feet), a loop of wire shall be utilized to loop to the end of the offset, bring the loop to grade and terminate it in an approved manner. For service leads and offsets of more than 20 feet in length, or installed by directional drilling method, a splice may be utilized to make the connection at the main. The tracer wire shall then be installed and terminated in an approved manner.
- C. Tracer wire terminations shall be made by one of the following methods:

method most applicable to field conditions shall be used.

1. Tracer wire shall be terminated at hydrants by tying off the wire at the head flange, leaving excess material for future trimming following landscape activities.

2. Terminations at valve/curb boxes, post indicators, valves and blow-offs shall be made with 2 wraps

- of wire at grade around the box or pipe, leaving excess material for future trimming following 3. Gatewell terminations shall be made by running the tracer wire through the pipe opening in the wall, down to and across the floor to the steps, up the wall and secure to the top step leaving the stub
- 4. Terminations at existing water mains without tracer wire shall be made at the nearest hydrant or gate well as outlined above. If no hydrant or gatewell is available, an upper section of valve box

accessible at the casting. Wire shall be run through the gatewell such that it does not create a

- shall be installed with the tracer wire stubbed up inside D. When connections are made to existing water mains which do not have tracer wire, the following
- 1. When connection is made at/near a valve or hydrant, the connection shall be made in the same manner as the termination at said structures in Item C(2) above.
- 2. When connection takes place in a gatewell, the same procedure shall be used as in termination at a gatewell (see Item C(3) above).

### 3. If no valve or hydrant is available, the upper section only of a valve box shall be set with the tracer wire stubbed up inside.

- 3.06 POLYETHYLENE ENCASEMENT A. The polyethylene encasement must be installed in accordance with the specifications and requirements of ANSI/AWWA C105/A21.5. For open cut applications a single wrap is required, and
- for directional drill applications a double wrap is required.

### B. The polyethylene encasement must be taped and overlapped at pipe joints and must be taped in a spiral configuration along the length of the pipe.

- 3.07 CONNECTION TO EXISTING MAINS
- B. All valves shall be operated by the Pittsfield Township Utilities Department.

A. All connections to existing water mains shall be made at the locations as shown on the plans.

OWNER and CONTRACTOR in the field to review the procedure. D. When making a dry connection to an existing main, the existing main to which a connection is to be made shall be isolated by the closing of the necessary existing valves, and the water from the existing main shall then be pumped out or removed by other means so the connection may be made in the dry. After the connection has been acceptably made, the portion of the new line to the nearest valve shall be satisfactorily tested and disinfected, along with the drained portion of the existing water main, before the isolated existing main is placed back in service, except as the ENGINEER may otherwise direct. In as much as residents served by this isolated main will be temporarily out of water during this period, the work shall be executed as rapidly as possible, and the time of, and the procedure in.

C. Prior to beginning construction of the final connections, the CONTRACTOR shall provide sequence of

all final connections to the existing system and coordinate a meeting between the ENGINEER,

requirements in work under this section. E. The CONTRACTOR shall make particular effort, prior to bidding, to ascertain whether or not valves in the existing mains to be connected to the new mains are so located as to provide isolation. If valves are not found to be adequate, then the CONTRACTOR shall utilize other means to make the

making such connections shall be subject to the review of the ENGINEER. Such work may be

required to be done at night in order to minimize inconvenience of water users. The CONTRACTOR

shall not be entitled to any additional compensation because of night work or other special

- connections with a minimum of interruption to service. F. When making a wet tap connection to an existing main, a tapping sleeve designed for the type of pipe being tapped shall be utilized and the tap shall be made in accordance with the manufacturer of the
- G. Wherever adapters are required to properly connect the pipe with existing pipe or other material or manufacturer, the nominal I.D. of adapters shall be the same size as the nominal diameter of pipe connected thereto. Adapters shall also be furnished and used as required by the manufacturer for

### 3.08 BEDDING

tapping equipment.

connection to fittings.

- A. Ductile iron pipes shall be fully enclosed in polywrap and laid on a compacted sand cushion, 4 inches thick. Sand shall conform to fine aggregate 2NS as defined in 2003 MDOT, Section 902.
- B. 2NS sand bedding material shall be placed around and above the main to a height of 12 inches above
- C. Sand shall be compacted on top of the 12-inches of sand above the pipe to not less than 95 percent of the maximum unit density as determined at optimum moisture content.

Pittsfield Charter Township 6201 W. Michigan Ave. Ann Arbor, MI 48108-9721 48108-9721

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SPEC. UPDATES

SPEC, UPDATES

File Name: W-02

Permit-Seal

Client/Project

Project No.

2075001300

PITTSFIELD TOWNSHIP

Pittsfield Township, Michigan

WATER MAIN SPECIFICATIONS

TWP REV

Revision

MRH DRW 14.01.2 BWA DRW 11.04.2 4 BWA DRW 10.10.25

10.01.1 Appd. YY.MM.D By Appd. YY.MM.D

TTN

DRW

BWA DRW DRW 07.10.0

YY.MM.D

Dwn. Chkd. Dsgn.

0 0

Revision

### PITTSFIELD CHARTER TOWNSHIP

### GENERAL

1. The contractor shall implement and maintain the soil erosion control measures as shown on the plans at all times during construction on this project. Any modifications or additions to the soil erosion control measures due to construction or changed conditions, shall be complied with as required or directed by the owner, project engineer or Pittsfield Township.

2. All soil erosion and sedimentation control work shall conform to the permit requirements of Pittsfield Township and the laws of the State of Michigan.

A NPDES construction activity permit is required for all sites greater than 5 acres.

4. Daily inspections shall be made by the contractor. Periodic inspections may be made by the owner/project engineer/Township to determine the effectiveness of erosion and sedimentation control measures. Any necessary corrections shall be made without delay. 5. Erosion and sedimentation from work on the site shall be contained on the site and not be allowed to collect on any off-site areas or in waterways.

6. All mud/dirt tracked onto roads from the site due to construction, shall be promptly removed by the contractor.

7. Restoration of all disturbed areas, including placement of topsoil, seed, fertilizer and mulch and/or sod shall be done within 5 days 8. Construction operations shall be scheduled and performed so that preventative soil erosion control measures are in place prior to

excavation in critical areas and temporary stabilization measures are in place immediately following backfilling operations. 9. Special precautions will be taken in the use of construction equipment to prevent situations that promote erosion. 10. Proper dust control shall be maintained during construction by use of water trucks and/or chloride as required.

11. The contractor shall be responsible for maintaining all temporary soil erosion control measures and removal of some upon authorized completion of project. Completion of project will not be authorized until all site work, home building, road work and utility construction is complete and all soils are stabilized.

12. The contractor shall not grade in existing wetland or conservation areas to be protected. Silt fence shall be installed and maintained adjacent to existing wetland and conservation areas to prevent grading, erosion and sedimentation into them. 13. Tree protection fencing must remain intact until restoration of the site is complete.

### SEQUENCE OF CONSTRUCTION

1. Install sediment fence and tree protection fencing prior to any grading operation.

Install mud-tracking pad.

Construct temporary sediment/detention basin.

4. Place topsoil, fertilizer, seed and mulch over the entire detention basin area. 5. Rough grade site, stockpile topsoil and begin building construction.

6. Install storm drainage system including riprap and parking lot inlet filters and detention basin standpipe.

7. Maintain erosion and sedimentation control measures, as required. Install sanitary sewer and water systems.

9. Bring pavement areas to sub-base grade, place sub-base and bituminous pavement.

10. Install franchised utilities. 11. Finish grade, redistribute topsoil, seed and mulch all disturbed areas.

12. Remove any accumulated sediment within the detention basin and replace clean washed stone around standpipe.

13. Complete construction of site.

14. Insure all soil is stabilized. Remove all temporary soil erosion control measures.

# SEEDING/SOD

Seed or sod in accordance with project specifications.

2. All areas of disturbed earth that are not to be paved or sodded shall have 4 inches of topsoil, seed, fertilizer and mulch. 3. Immediately after seeding, mulch all seeded areas with unweathered small grain straw (preferably wheat) or hay spread. Spread uniformly at the rate of 1 ½ to 2 tons or 100 pounds (2 to 3 bales) per 1,000 square foot. This mulch should be anchored with a disc-type mulch-anchoring tool.

4. Any disturbed area not paved, seeded or mulched, sodded or built upon by November 15, is to be mulched in the manner as specified above, in order to provide soil erosion protection during the winter and early spring.

5. All erosion and sedimentation control prevention procedures and structures are to comply with the Standards and Specifications for

soil erosion and sediment control of the Washtenaw County Soil Conservation District.

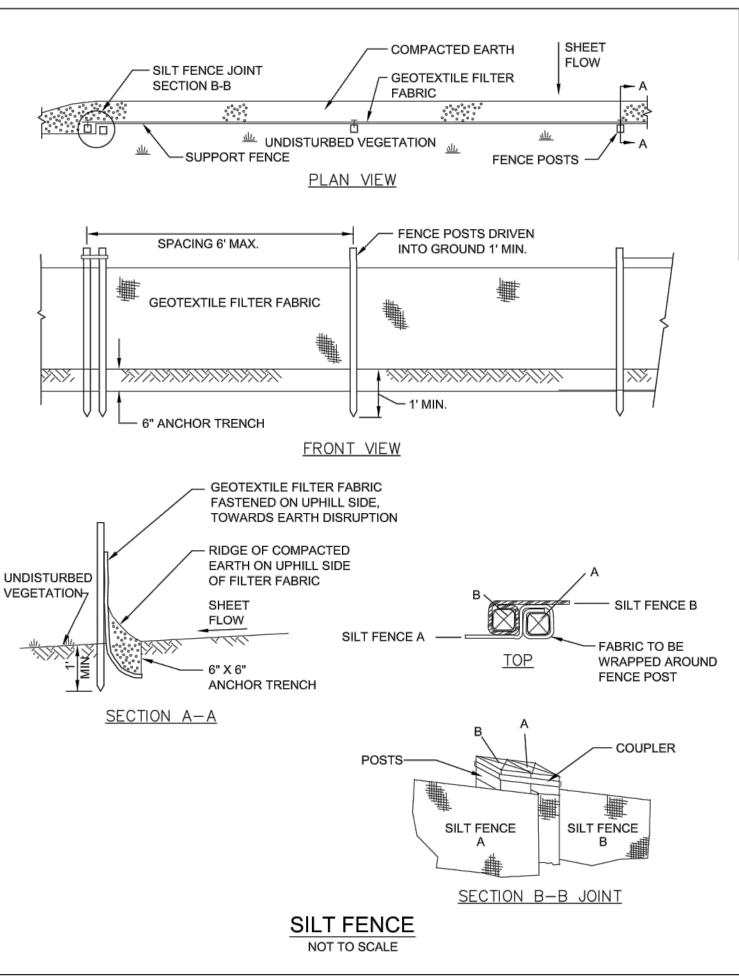
6. Drainage ditches and slopes steeper than 1:4 (25%) shall be stabilized with erosion control blankets. 7. Steep slopes that do not take upon initial seeding must be re-seeded and stabilized with erosion control blankets.

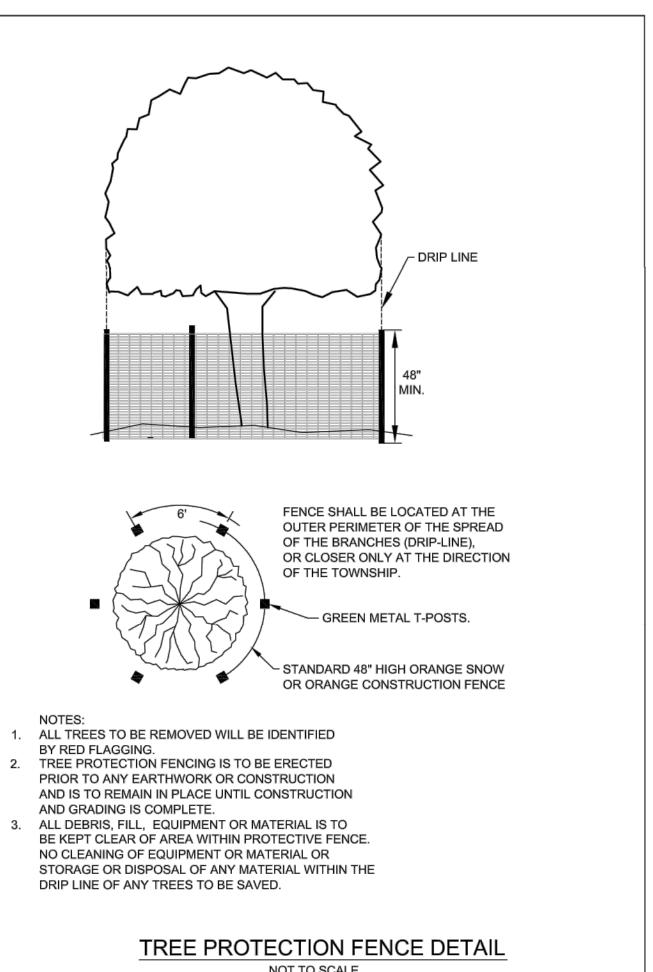
8. Where excavation has been through lawn areas, the CONTRACTOR shall restore the disturbed area by placing topsoil and seeding or sodding over the final backfill material.

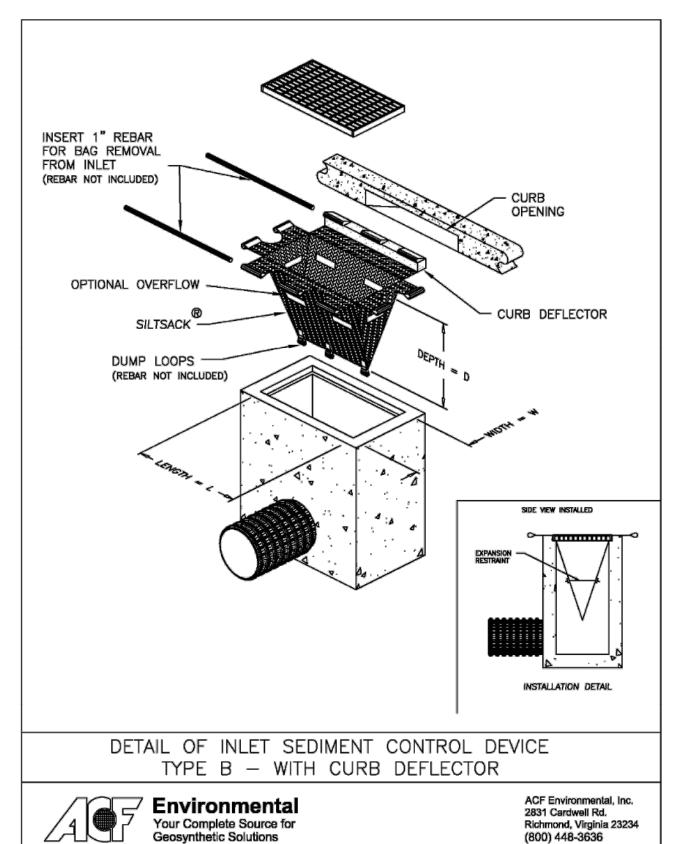
### CATCH BASIN/MANHOLE PROTECTION 1. Protect storm sewer catch basins with Siltsack. or approved equivalent as follows:

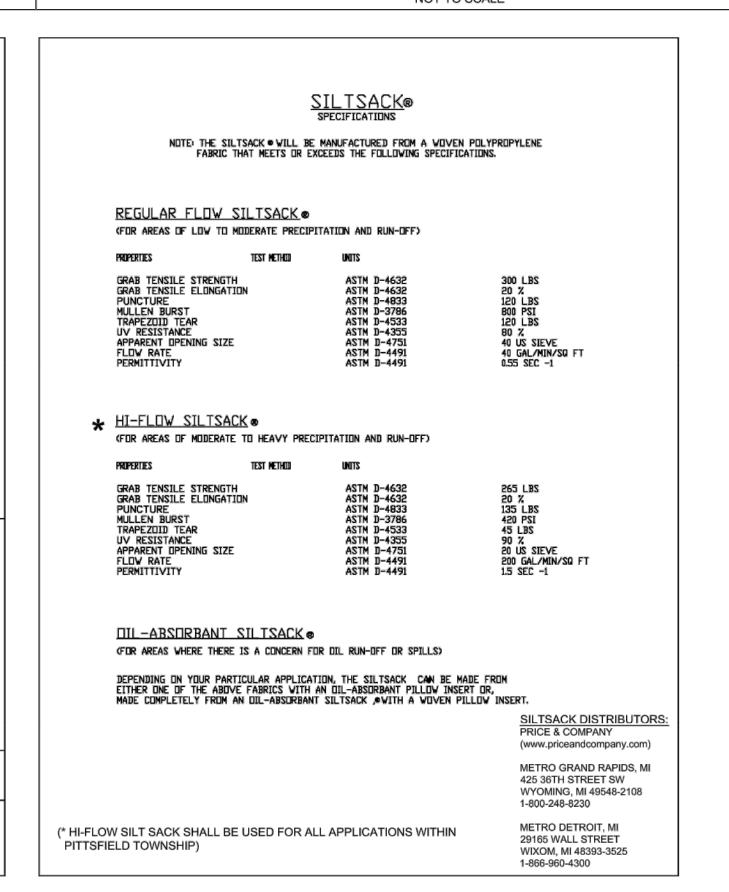
1. During construction, all roads shall be protected from unvegetated areas washing onto road surfaces by placement of silt fence behind curb or a 10 foot wide straw mulch bank behind the curb or other approved method and/or as shown on the plans. 2. During construction of any portion of the project, roads shall be maintained free of dirt, silt and construction debris.

Pittsfield SEC 9/22/2009









SILTSACK NOT TO SCALE



Pittsfield Charter Township 6201 W. Michigan Ave. Ann Arbor, MI 48108-9721 48108-9721 Tel. 734.822.3101 www.pittsfield-mi.gov

SILTSACK

TWP REV

UPDATES

Revision

File Name: SE-01

Permit-Seal

Client/Project

PITTSFIELD TOWNSHIP

Pittsfield Township, Michigan

2075001300

SOIL EROSION DETAILS AND NOTES

NOT TO SCALE

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Revision

### 1.01 DESCRIPTION

A. The CONTRACTOR shall perform all excavation and backfilling necessary to complete the work. This shall include the excavation of earth and rock, the removal and disposal of unsuitable material, dewatering, placement of suitable fill and backfill material, pipe boring and jacking, all quality assurance testing, and the restoration and final grading for all earth surfaces.

### 1.02 WORK WITHIN RIGHTS-OF-WAY

- A. Where the governmental bodies having jurisdiction of the streets or rights-of-way have specific specifications relating to the requirements for work within their jurisdiction, such requirements must be met as a minimum requirement, and if these Specifications impose further limitation on the work, they shall also be met as the required work standard.
- B. During all operations of the CONTRACTOR in the streets and roadways, the CONTRACTOR shall maintain barricades, lights, and warning signs as required by the agency having jurisdiction.

### 1.03 WORK WITHIN EASEMENTS

A. During construction within any easements, the CONTRACTOR shall confine himself to the limits shown on the Plans. He shall notify property owners in advance of moving equipment on easements and use of the access routes which will be designated by the OWNER. The OWNER will cooperate in working out the details of access. The topsoil over the trench shall be removed and carefully replaced upon completion of the work. The backfill of the trench in the easement may be left slightly high to provide for any slight residual settlement. Any trees, shrubs, or bushes removed shall be replaced to the satisfaction of the property owner.

### 1.04 SOIL BORINGS

A. Soil boring results, if taken on a site, are appended to these Specifications with locations noted. Boring logs are shown to be generally representative of the site and to assist in the design and construction of the work.

### 2.00 PRODUCTS

### 2.01 BACKFILL MATERIAL

- A. For areas not requiring "granular backfill" material, backfill shall be of the excavated material, with the exception that materials such as soft clay, topsoil, muck, cinders, vegetable matter, refuse, boulders and other objectionable and non-packing earth shall be excluded from the backfill and removed from the site. Stone larger than 3 inches in any dimension shall be excluded from the backfill and removed from the site by the CONTRACTOR.
- B. Where "granular material" backfill is required as specified herein, backfill material shall be defined as a material meeting granular material Class II as defined in 2003 MDOT 902.08.
- C. All utilities within road right-of-way corridor (existing or proposed) shall be backfilled with MDOT CL Il granular material compacted to 95% maximum unit weight.
- D. All utilities shall be installed with 2 NS sand bedding or better.

### 2.02 ENCASING PIPE

- A. Steel encasing pipe for boring and jacking shall conform to the requirements of either, ASTM A53, Type E or S. Grade B or ASTM A139, Grade B.
- B. Steel encasing pipe used under channels and highways shall meet the requirements of the governmental agency having jurisdiction and the following minimum requirements:

Nominal Diameter	Maximum Wall			
(Inches)	Thickness			
Under 13	0.188 inches			
13-24	0.250 inches			
25-36	0.312 inches			
42	0.438 inches			
48	0.500 inches			
54	0.563 inches			

C. Steel encasing pipe used under railroads shall meet the requirements of the railroad and the following minimum requirements:

Minimum Wall Thickness (inches)				
Coated or Cathodically	Uncoated & Unprotected			
Protected				
0.180	0.251			
0.219	0.282			
0.250	0.313			
0.281	0.344			
0.312	0.375			
0.344	0.407			
0.375	0.438			
0.406	0.469			
0.438	0.501			
0.469	0.532			
0.500	0.563			
0.563	0.626			
	0.180 0.219 0.250 0.312 0.312 0.375 0.406 0.438 0.469 0.500			

- Casing pipe joints shall be welded to form a leak-proof continuous casing.
- E. The inside diameter of casing pipe shall be at least 2 inches greater than the largest outside diameter of the carrier pipe joints or couplings for carrier pipe less than 6 inches in diameter, and at least 4 inches greater than the largest outside diameter of the carrier pipe joints for carrier pipe 6 inches and over in diameter, unless otherwise shown on the Plans.
- The steel casing pipe shall be of smooth interior and shall be placed accurately to line and grade, allowing for the encased pipe thickness and supports under each length of encased pipe.

### 3.00 EXECUTION

3.01 GENERAL EXCAVATION

- A. Excavation shall be performed by any practicable method consistent with the integrity and protection of the work and neighboring structures, workmen, and the public. Topsoil shall be separately removed and stockpiled for reuse.
- B. All excavation, except where necessary to tunnel, bore or jack under roads, railroads, tree roots and other obstructions within the limits indicated on the Plans, may be open cut from the surface. Tunneling or boring under trees shall be considered as incidental to construction and will not be considered as cause for request for additional payment.
- C.Foreign material or unsuitable foundation material encountered such as wood, boulders, etc., which obstruct the excavation, shall be removed. Such materials found at the bottom of the excavation shall be removed and the foundation restored with approved materials.
- D.If excess excavation is made or the material becomes disturbed so as to require removal beyond the prescribed limits, the resulting space shall be filled with selected material solidly tamped into place, in not more than 6-inch layers to the satisfaction of the ENGINEER, before the construction work proceeds. At the direction of the ENGINEER, the excess excavation may be filled with 2000 psi concrete at the
- E. The excavation shall be kept dry during the work. Where water is encountered in the excavation, it shall be removed by pumping or well points. All necessary precautions shall be taken to prevent damage to existing wells and to completed or partially completed structures. The CONTRACTOR shall be responsible for all damages caused by him due to inadequate or improper protection.
- F. The CONTRACTOR shall take ample precautions to protect all trees and ornamental shrubbery not within the limits of the construction areas, or within the construction areas shown on the Plans to be retained from injury by workmen, equipment, or any other agencies connected with the work, including subcontractors. Such protection shall be provided during the progress of the excavation, grading, or other phases of the work as necessary. Such trees or shrubbery shall be surrounded by protective posts or fencing before construction begins, when in judgment of the ENGINEER, such precautionary measures are necessary. If, as a result of any phase of the work, trees are damaged or it is necessary to remove limbs in the way of construction, the repair of the damage and such limb removal shall be done by the CONTRACTOR as directed by the ENGINEER. All costs for the protective work shall be borne by the CONTRACTOR as incidental the Contract work.
- G.Anv excavation not backfilled at the end of each day must be clearly marked and surrounded by appropriate safety fencing as directed by the ENGINEER. If directed by the ENGINEER, the CONTRACTOR shall cover the open excavation with a steel plate and light the excavated area.

### 3.02 EXCAVATION FOR SEWERS AND WATER MAINS

net clearance of 18 inches on each side of the barrel of the pipe.

- A. Trenches shall be excavated to the depth required with allowance for bedding the pipe. The trench shall be cut wider and deeper at each pipe joint location to provide for properly completing the pipe joint and to relieve the joint of all loadings.
- B. The width of the trench at the top of a rigid pipe shall be sufficient to allow the pipe to be laid and jointed properly and shall provide for a minimum net clearance of 6 inches and a maximum net clearance of 12 inches on each side of the barrel of the pipe and to allow the backfill to be placed and properly compacted.
- C. The width of trench at the top of a flexible pipe backfill when using concrete bedding shall be sufficient to allow the pipe to be laid and jointed properly with the minimum net clearance of 12 inches and a maximum
- D. Where the conditions of the ground require or where the work is in close proximity of existing structures, the sides of excavation shall be securely held by bracing and/or sheeting which may be removed in units when the level of the backfill has reached a point where it is safe to pull the sheeting without disturbing the protected feature. No sheeting, bracing, or other timber shall be left in the excavation upon the completion

of the main or other structures, except with the specific review and direction of the ENGINEER.

- E. Other underground mains, sewers or structures encountered in the excavation shall be adequately supported during the CONTRACTOR's operations, and before backfilling, shall be given permanent support as directed by the ENGINEER to meet the standards or requirements of the owning utility or
- F. Water, sewer, gas and other utility services disturbed by the CONTRACTOR in his operations shall be repaired or replaced in a manner equal to the original condition by the CONTRACTOR at his own expense. Where these services are encountered and are undamaged, they shall be supported and/or protected by the CONTRACTOR at his expense against later settlement and/or damage after backfill. The CONTRACTOR shall consult the agency or the utility firm having jurisdiction over any duct line, gas main, etc., which may cross the excavation to determine method of supporting such duct or pipe.
- G.All excavated material shall be piled in a manner that will not endanger the work and that will avoid stop boxes, fire and police call boxes, or other utility controls shall be left unobstructed and accessible until the work is completed. Gutters shall be kept clean, or other satisfactory provisions made for street drainage, and natural water courses shall not be obstructed except as otherwise provided for herein on a

### 3.03 EXCAVATION FOR STRUCTURES

- A. Excavation for structures shall be extended sufficiently beyond the limits of the structure to provide ample room for form construction and for practicable construction methods to be followed.
- B. Requirements for excavation of sewers and water mains shall also apply to this Section.

### 3.04 EXCAVATION FOR PAVED SURFACES

- A.In excavating around manholes and catch basins or inlets, care shall be exercised to avoid removing the casings and pushing dirt into the structures. Dirt pushed into manholes, catch basins or inlets by the CONTRACTOR's operations shall be immediately removed so that the dirt will not be carried into the sewer by the flow of sewage or storm water.
- B. The CONTRACTOR shall take ample precautions to protect all trees and ornamental shrubbery not within the limits of the construction area, or within the construction areas shown on the Plans to be retained from injury by workmen, equipment, or any other agencies connected with the work, including subcontractors. Such protection shall be provided during the progress of the excavation, grading, or other phases of the work as necessary. Such trees or shrubbery shall be surrounded by protective posts or fencing before construction begins, when in the judgment of the ENGINEER, such precautionary measures are necessary. If, as a result of any phase of the work, trees are damaged or it is necessary to remove limbs in the way of construction, the repair of the damage and such limb removal shall be done by the CONTRACTOR as directed by the ENGINEER. All costs for the protective work shall be borne by the CONTRACTOR as incidental to the Contract work.

### 3.05 ROCK EXCAVATION

- A. Rock excavation shall consist of excavating igneous, metamorphic and sedimentary rock which cannot be excavated without continuous drilling and blasting or drilling and splitting to fracture the rock. Blasting shall be permitted only after it has been shown that other methods of excavation are impractical. All rock excavation shall be carried to a minimum depth of 8 inches below the pipe or manhole bottom and to the bottom of all footings. The width of the rock excavation shall not exceed the diameter of the pipe plus 12 inches on either side or the edge of the foundation footing.
- B. When the use of explosives is necessary for the progression of the work, the CONTRACTOR shall comply with all laws, ordinances and applicable safety code requirements and regulations relative to the handling, storage and use of explosives and protection of life and property. A person competent and experienced in the use of explosives shall be employed to supervise the work. The CONTRACTOR shall schedule all blasting for a definite hour of the day and shall so notify all residents and businesses in the area as to the scheduled day and hour for such blasting operations. Explosive materials shall not be stockpiled and stored in residential areas. Explosives and initiating devices shall not be carried in the same vehicle.
- C. Suitable weighted plank coverings or timber mats shall be provided to confine all materials lifted by blasting within the limits of the excavation of trench. Excessive blasting or overshooting shall not be permitted Any material outside of the authorized excavation cross section which may be shattered or loosened shall be removed at the CONTRACTOR's expense. The CONTRACTOR shall be responsible for all damage resulting from the use of explosives.

### 3.06 PIPE BORING AND JACKING

- A. The CONTRACTOR shall obtain all necessary permits for jacking the encasing pipe under channels, highways and/or railroads and shall notify the governmental agency and/or company having jurisdiction 48 hrs before work at any crossing is started. The CONTRACTOR shall pay all costs for an inspector and/or flagmen required by a railroad or governmental agency.
- B. A suitable approach trench shall be opened, adjacent to the toe of the slope of the embankment. The approach trench shall be long enough to accommodate the length of pipe units to be placed, and wide enough to provide sufficient working room. Guide timbers or rails for keeping the pipe on-line and grade shall be installed in the bottom of the trench and heavy timber backstop supports installed at the rear of the trench to take the thrust of the jacks. A timber bearing a "pushing frame" shall be built and furnished to fit or match the end of the pipe to be jacked, so that the pressure of the jacks will be evenly distributed over the end of the pipe. Two (2) hydraulic jacks of sufficient power shall be used to apply pushing or jacking pressure. For firm ground, excavation shall be carried on from inside the pipe, not to exceed twelve (12) inches ahead of the lead pipe. For unstable ground, the lead pipe shall precede the auger. Excavation at the top and sides shall be accurately cut to line and grade. Adjoining sections of steel pipe shall be welded. Pipe shall be jacked on successive shifts until completed to guard against the "freezing of the line"
- due to settlement and compaction of surrounding soil. C. The sheeting of pits along any road will be required if the leading edge of all work pits will be closer to the pavement edge than the shoulder point or ten (10) ft, which ever distance is greater, or on curb and gutter sections, at least five (5) ft from back of curb.
- D. Upon completion of the installation of the steel pipe encasement, the contractor shall furnish and install a bolted style casing spacer as described below on the carrier pipe. Casing spacers shall be placed a maximum of seven (7) feet apart along the length of the carrier pipe with one casing spacer within 2-1/2 feet of each side of a pipe joint and the rest evenly spaced. Wood skids are not an acceptable method of supporting the carrier pipe.
- 1. Casing spacers for carrier pipes from 4" 24" shall be made of a molded, segmented high density polyethylene plastic with 304 stainless steel connecting nuts and bolts. Minimum spacer width shall be 5.2" for carrier pipes from 4" - 12" and 7.0" for carrier pipes 14" - 24". Each casing spacer shall have at least six (6) integrally molded skids extending 1" beyond the bell or mechanical joint of the carrier pipe. The casing spacers shall be equal to the PSI Ranger as manufactured by Pipeline Seal and Insulator,
- 2. Casing spacers for carrier pipes larger than 24" shall be a PVC fusion bonded coated (10-16 mils) steel shell (minimum 14 gauge steel) with a 90 mil PVC inner liner and 2" wide 30% glass reinforced polyester runners (minimum compressive strength = 18,000 psi) (polyethylene is not an acceptable runner material) attached by 3/8" coated steel studs welded to the steel shell. All bolts and nuts used to fasten the shell to the carrier pipe shall be cadmium plated steel. Where riser are required under the runners they shall be a minimum 10 gauge steel welded to the shell and coated as specified for the shell (epoxy is not an acceptable coating for the shell riser). The casing spacers shall be equal to the PSI Model C as manufactured by Pipeline Seal and Insulator, Inc., Houston, Texas.
- E. Boring shall be performed by accepted and recognized methods which will provide adequate safety and protection at all times to workmen employed in the work and to inspectors and others involved in the
- F. If voids should develop around the outside of the encasing pipe, grouting or other methods approved by the ENGINEER shall be employed to fill such voids.
- G.After the pipes are tested satisfactorily, the remaining space between the carrier pipe and the encasing pipe shall be pressure grouted or otherwise filled with concrete. The carrier pipe shall be adequately braced to prevent floating or movement of the pipe.

### 3.07 SHORING, SHEETING AND BRACING

- A. Where sheet piling, shoring, sheeting, bracing, or other supports are necessary, they shall be furnished, placed, maintained, and except as shown or specified otherwise, removed by the CONTRACTOR.
- B. All sheet piling, shoring, sheeting and bracing shall be designed by a professional engineer engaged by the CONTRACTOR with demonstrated competence and experience in such work. The sheeting system shall be designed to prevent bottom failure and hydrostatic uplift within the excavation. Provision shall also be made in the design for lateral pressures due to side slope and construction equipment or other surcharge loads, as applicable.
- C. The CONTRACTOR shall provide to the ENGINEER for his review, design calculation and arrangement drawings of the sheeting system prior to ordering any materials for bracing, sheeting, etc., and prior to the commencement of the excavation.
- D. All materials, except as otherwise specified, used for sheeting and sheet piling, lagging, braces, shores, and stringers, or waling strips shall be of approved quality and dimensions throughout.
- E. Materials for sheeting systems shall be furnished and driven or set in place by the CONTRACTOR, where necessary or wherever ordered by the ENGINEER, whether the same is or is not considered necessary by the CONTRACTOR. If, in the opinion of the ENGINEER, the materials furnished by the CONTRACTO are not of proper quality or sufficient size or not properly placed to ensure the safety of the work or of adjacent structures and property, the CONTRACTOR shall, upon notice from the ENGINEER to that effect. forthwith procure, furnish and set in place or drive other and satisfactory materials, or place the material in a satisfactory manner; and if he shall fail or neglect to do so, the ENGINEER may order all or any part of the work to be stopped until such materials so used are furnished and placed; and the CONTRACTOR shall not be entitled to claim, demand, or receive any compensation for larger size or better quality or different disposal of materials ordered by the ENGINEER, nor any compensation for allowance of any kind whatsoever for or on account of any damage or delay resulting from such stoppage of work.
- F. Steel sheet piling may be either new or used. It shall be of adequate strength, straight and properly braced. Steel sheet piling shall be of the interlocking type. Friction in the interlocks shall not be assumed to contribute to the strength of the sheet piling.
- G.The design, planning, installation and removal, if required, of all sheet piling, shoring, sheeting, and bracing shall be accomplished in such a manner as to maintain the required excavation or trench section and to maintain the undisturbed state of the soils below and adjacent to the excavation.
- H. Steel sheet piling for the excavation shall be driven straight and in-line. The piling shall be supported above ground, before driving, by a guide frame at least 20 ft high which will keep the piling accurately in the required position and vertical. Each piece of piling shall be driven only a few feet at a time and driving shall proceed continuously around the perimeter so that the piles shall reach their full penetration together.
- I. Walers and bracing shall be supplied and installed as required to complete the sheeting system. Walers and braces shall be of adequate strength for the load imposed. Splices in walers shall develop the full strength of the member in bending, shear, and axial compression.
- J. If bracing members are to be removed during construction, the timing and procedure for removal shall not induce excessive stresses in the permanent structures or in steel sheet piling and bracing members.
- K. If the construction sequence of structures requires the transfer of bracing to the completed portions of any structure, the CONTRACTOR shall secure written acceptance of the ENGINEER prior to the installation of
- L. In trenching operations the use of horizontal strutting below the barrel of pipe or the use of the pipe as support for trench racing will not be permitted. The use of a traveling shield for sewer construction shall require that the device be approved for use by a professional engineer. Sheet piling and timbers in trench excavations shall be withdrawn in a manner so as to prevent subsequent settlement of the pipe or additional backfill loadings which might overload the pipe.
- M.The neglect, failure, or refusal of the ENGINEER to order the use of sheeting, or sheet piling or steel, or to order the same to be left in place, or the giving or failure to give of any order or directions as to the manner or methods of driving or placing sheeting, sheet piling, bracing, shores, etc., shall not in any way relieve the CONTRACTOR of any or all obligations under this Contract. Sheeting left in place shall be cut off one (1) ft below existing grade.
- N. The rules of the OSHA and the State Department of Labor with respect to excavation and construction shall at all times be strictly observed.

### 3.08 GENERAL BACKFILLING

- A. For all areas, unless otherwise noted, backfilling shall consist of placing excavated material as defined in Paragraph 2.01.A. of this Section, in 12-inch lifts to finish grade. Compaction of backfill shall be such as to obtain 90% of the maximum density.
- B. Under pavements, curb, paved driveways, and sidewalks, and where pipe is within a one on one influence of pavement, compaction testing shall be performed by an independent testing laboratory. Testing shall be performed at intervals of one test per lift per 50 feet of trench or as determined necessary by the ENGINEER.
- C.In residential developments, all backfill within the road corridor shall be granular material compacted in layers not to exceed 12 inches loose thickness with backfilling carried up to subgrade. Compaction of backfill shall be as such to obtain 95% of the maximum unit density as determined at the optimum moisture content. For purposes of this section, the road corridor is defined as front of house to front of house. including right-of-way and adjacent easements and setbacks.

### 3.09 BACKFILLING FOR SEWERS AND WATER MAINS

- A. Backfilling shall consist of placement of the prescribed materials from a level 12 inches above the crown of the pipe. Placement shall be as follows:
- 1. Under gravel driveways, gravel roads and shoulders, the backfill shall be granular material which shall be solidly compacted by mechanical tamps in layers of not more than 12 inches loose thickness with backfilling carried up to within 12 inches of finished grade. Compaction of backfill shall be such as to obtain 95% of the maximum unit density as determined at the optimum moisture content.
- 2. Under pavements, curb, paved driveways, and sidewalks, the backfill shall be granular material compacted in layers not to exceed 12 inches loose thickness with backfilling carried up to subgrade. Compaction of backfill shall be such as to obtain 95% of the maximum unit density as determined at the optimum moisture content. After a period of about 60 days or less, if the backfill compaction is satisfactory to the ENGINEER, to provide for any slight settlement, the CONTRACTOR shall retrim neatly any broken edges of pavement and replace the top surface of the backfill within the pavement area with pavement surface equal to that surface which was removed. The pavement shall be replaced in accordance with the standard specifications of the agency having jurisdiction.
- 3. Backfill around lift stations, or buried underground structures shall be granular material compacted in 12-inch lifts. Compaction of backfill shall be such as to obtain 95% of the maximum unit density as determined at the optimum moisture content.
- 4. For all other areas, backfilling shall consist of placing excavated material as defined in Paragraph 2.01.A. of this Section, in 12-inch lifts to finish grade. Compaction of backfill shall be such as to obtain 90% of the maximum unit density as determined at the optimum moisture content.

### 3.10 FILLING AND BACKFILLING FOR STRUCTURES

- A.Embankments underlying structural footings, streets and drives, sidewalks and around structures shall be granular material meeting the requirements of the Michigan Department of Transportation for granular material compacted to 95% density.
- B. In all other areas, material required for embankments and backfilling shall be soil or soil-rock mixture free of organic and other deleterious matter and shall contain no more than 15% rocks or lumps larger than 2-1/2 inches in the greatest dimension, compacted to 90% density.
- C.Under all interior and exterior floor slabs, an 8-inch thick granular cushion shall be placed. This material shall be clean mineral aggregate meeting the following gradation requirements:

Passing the No. 4 Sieve Passing the No. 200 Sieve 0-3%

D. Where embankment material is placed to achieve a new surface elevation, the top 4 inches shall be approved topsoil either salvaged from the site or hauled in by the CONTRACTOR.

### 3.11 FILLING AND BACKFILLING FOR PAVED SURFACES

- A.Embankments, including sand cushions and granular fills, shall be placed in successive layers not more than 6 inches in depth the full width of the cross section, each layer to be thoroughly compacted by means of vibratory compactors or by an approved pneumatic-tired roller or combination thereof, as required by the ENGINEER. Each layer shall be compacted to not less than 95% of the maximum unit density as determined at the optimum moisture content. All parts of the embankment shall be uniformly compacted and the CONTRACTOR shall so direct all earthmoving equipment used in the work so that the same shall be attained. Embankment or fill outside the limits of the subgrade where sand or gravel is not required shall be made with suitable material which is free from perishable organic matter, rubbish, stones, broken concrete, roots, or other foreign materials, at no additional compensation. Before any embankments are begin, the base shall be made firm and cleared of topsoil, sod or other perishable material. The sides of the embankment shall be neatly and evenly dressed to the slope shown on the Plans, or such other slope
- B. Upon completion of the placing of the curbs, and after the concrete has cured sufficiently, forms shall be removed and the excavated space behind the curb shall be backfilled with a good quality of surface soil, free of rubbish, stone, broken concrete, roots or other foreign material. Where adequate acceptable material for backfill behind the curb is not available, granular fill conforming to 2003 MDOT 8.02.06, Class II, shall be used. Where the area behind the curb is in cut, it shall be trimmed from the top of the curb on the slope shown on the Plans. If the area is in embankment or fill, an earth berm shall be placed immediately adjacent to the top of the curb and then the embankment of fill shall be finished to the slope shown on the Plans. All trimming and finishing shall be done in a neat, workmanlike manner. All excess concrete and debris shall be removed from the excavation behind the curb line before backfilling begins.
- C.In construction of non-rigid pavements, backfilling back of curb and gutter shall be completed before placement and compaction of the base course of the roadway.

### 3.12 PREPARATION OF SUBGRADE FOR ROADWAY SURFACES

- A. The bottom of the excavation for the pavement or top of the fill shall be known as the pavement subgrade and shall be smoothed, trimmed and compacted to the required line, grade and cross section to receive the road metal. It shall be thoroughly compacted by rolling with a roller of approved type weighing not less than 8 tons. The subgrade shall be compacted to at least 95% of the maximum density as designated by the test method AASHTO T-180. Inaccessible areas, where rolling is not practical, shall be thoroughly compacted by mechanical tampers capable of striking a blow equivalent to at least 250 foot-pounds per square foot. The subgrade thus formed shall be maintained in a smooth and compacted condition until the pavement has been placed. No base course, surfacing, curb, or curb and gutter, shall be placed until the subgrade has been reviewed by the ENGINEER. The subgrade shall be finished in an acceptable condition at least one day in advance of the pavement construction at all times. Six inches of compacted depth of granular material shall be used where uncompactable soil is encountered. The granular fill shall conform to the 2003 MDOT 9.02.08., Class II, compacted to 95% of its density.
- B.Immediately prior to placing the pavement, the subgrade shall be tested for conformity with the cross section shown on the Plans by means of an approved template riding on the curb and gutter sections or on side forms. If necessary, materials shall be removed or added, as required, to bring all portions of the subgrade to the correct elevation. Corrected portions shall then be thoroughly compacted and again tested with the template. Pavement material shall not be placed at any portion of the subgrade which has not been tested for correct elevation.
- C.The finished subgrade shall be maintained in a smooth and compacted condition until the pavement is placed. No storage piles of fine or coarse aggregate shall be placed directly upon the finished subgrade. Should the subgrade become rutted or disturbed in any manner, it shall be reshaped and recompacted.

### 3.13 GRADING

- A. The CONTRACTOR shall grade the site to achieve the elevations as shown on the Plans. All disturbed areas beyond the grading limits shall be restored to prior condition
- B. Surplus excavated material not needed for embankment shall be disposed of by the CONTRACTOR. Headwalls, culverts, drains, sewers and appurtenances filled or damaged by the CONTRACTOR during the course of his operations shall be cleaned, repaired, or replaced at his expense.
- C. All temporary earth changes shall be in conformance with the Soil and Erosion Control Act.

### 3.14 RESTORATION

- A. Headwalls, culverts, and drainage systems filled or damaged by the CONTRACTOR during the course of his operations shall be cleaned, relaid or rebuilt with new materials to a condition equal to the original state, and of thickness equal to the original structure and to the original line and grade at the CONTRACTOR's expense.
- B. Where the excavation is located beside a ditch and/or where an existing ditch is filled or disturbed in the CONTRACTOR's operations, the CONTRACTOR shall clean, repair, or replace the ditch with properly pitched bottom and side slopes and of section and capacity not less than the original section.
- C. Where excavation has been through lawn areas, the CONTRACTOR shall restore the disturbed area by placing topsoil and seeding or sodding over the final backfill material.
- D. The CONTRACTOR shall remove excess dirt and other construction material from the site of the work and leave the site in a condition equal to its original state.
- E. The final condition of the streets and roadways shall be subject to the approval of the governmental body having jurisdiction thereof, as well as review by the ENGINEER.

Pittsfield Charter Township 6201 W. Michigan Ave. Ann Arbor, MI 48108-9721 48108-9721 Tel. 734.822.3101 www.pittsfield-mi.gov

**UPDATES** 

Revision

Issued

File Name: SE-02

Permit-Seal

Client/Project

Project No.

2075001300

PITTSFIELD TOWNSHIP

Pittsfield Township, Michigan

EARTHWORK SPECIFICATIONS

NOT TO SCALE

**4** 

BWA DRW

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TTN DRW 10.01.2

11.04.2

YY.MM.D

By Appd. YY.MM.D TTN DRW DRW 07.10.0 Dwn. Chkd. Dsgn. YY.MM.DD

Revision

View #3

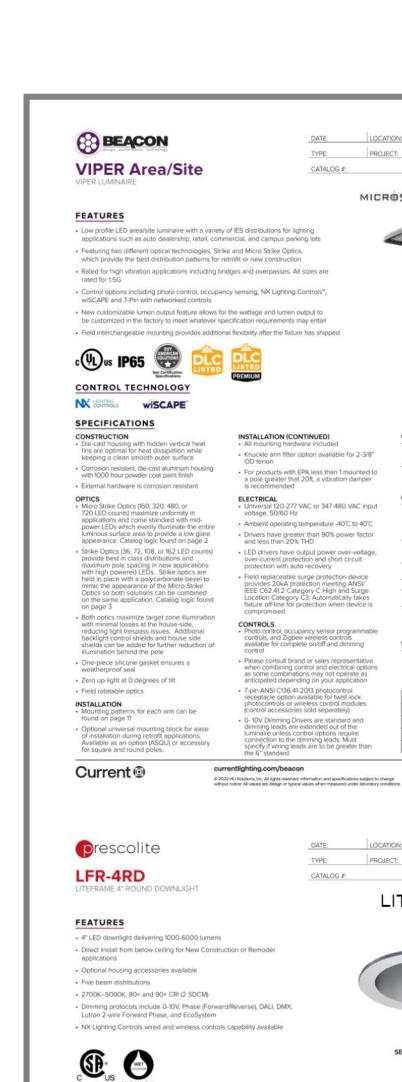
Statistics						
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Perimeter Rev2	+	0.1 fc	2.1 fc	0.0 fc	N/A	N/A
Parking/Drive Rev2	+	2.4 fc	4.5 fc	0.3 fc	15.0:1	8.0:1

SITE PLAN
Oak Valley Outparcel

DL4

SCALE : 1"=30'-0"

Designer
BG
Date
4/5/2023
Scale
Not to Scale
Drawing No.
Summary



CONTROL TECHNOLOGY

57° visual cutoff to source image and 31° cutoff to source

Current @

LIGHTING CONTROLS

TYPE: PROJECT: CATALOG #: SERVICE PROGRAMS STOCK

Listed to UL1598 and CSA C22.2#250.0-24 for wet locations and 40°C ambient temperatures

1.5 G rated for ANSI C136.31 high vibration applications

 Meets IDA recommendations using 3K CCT configuration at 0 degrees of tilt This product qualifies as a "designated country construction material" per FAR 52.225-11 Buy American-Construction Materials under Trade Agreements effective 04/23/2020.

KEY DATA

Lumen Range 5,000-80,000

Wattage Range 36–600 Efficacy Range (LPW) 92–155

Weight lbs. (kg) 13.7-30.9 (6.2-13.9)

DATE: LOCATION:

TYPE: PROJECT:

MICROSTRIKE STRIKE

CATALOG #:

SPECIFICATIONS • cCSAus certified to UL 1598 Chip-on-board LED with 2 SDCM CONSTRUCTION Standard Fixture Module designed for Non-IC, Direct Install construction Multiple CCTs, 80+ or 90+ CRI Optional Non-IC frame or IC housing available with pre-installed bar hangers Long LED life: L90 at >50,000 hours (TM-21) Universal voltage 120–277V driver, 347V optional Die cast aluminum fixture module support ring with spring steel clips for secure mounting to ceiling UL Class 2, inherent short circuit and overload protection Driver J-Box can be installed and accessed from below the ceiling as direct install or easily snap on to optional housing frame/enclosure
 O-10V, Phase (Forward/Reverse), DALL conductors rated for 90°C through wining Light Engine connections use plenum rated (CMP) cable Integral and remote emergency battery OPTICS
- High purity spun aluminum reflector, self-flanged

currentlighting.com/prescolite

options available INSTALLATION
- Accommodates ceiling thickness from 0.50° to 2.50°

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 For ≥50L: Marked spacing required 36\* fixture center to center; 18\* fixture center to building member; 0.5\* above fixture Suitable for wet locations, covered ceiling when used with CL lens trim; all other configurations, suitable for damp locations EM/EMR: Certified under UL 924 standard for O-10V, Phase (Forward/Reverse), DALL, DMX, Lutron 2-wire Forward Phase, and EcoSystem options

Approved for 8 (4 in/4 out) No. 12AWG conductors rated for 90°C through wiring WARANTY

System options • 5 year warranty

Spring cutoff to source image and 3T cutoff to source

 Specular or Semi-Specular anodized or White pointed cone reflector finish/colors

 Painted flange options in White or Black

 Optional clear lens trim for wet location applications

 Wide Angle and Soft Focus lens filter/clip accessories available

 To 250'

 Fixture Module including driver fully accessible from above or below the ceiling

 10L Fixture Modules are inherently protected IC without the use of IC housing enclosure. (IC housing enclosure. (IC housing enclosure.)

 Wattage Range

 Wattage Range

 Befficacy Range (LPW)

 To 250'

 Wattage Range

 Befficacy Range (LPW)

 Reported Life (Hours)

 Input Current (mA)

 66-425 (20V)

 Tassed on Specular, 35K, 80 CR

1 Size 1 1601.35 \* 5500 lumens 1600.75 \* 7500 lumens 1600.450 \* 75000 lumens 16000 lumens 16000 lumens 16000 lumens 16000 lumens 16000 lumens 16000 lumens 1700.435 \* 75000 lumens 170000 lumen PSS Platinum Silver Smooth WHT White Matte Textured Current @ © 2022 HLI Solutions, Inc. All rights reserved. Information and specifications subject to change without notice. All values are design or typical values when measured under laboratory conditions. prescolite TYPE: PROJECT: LFR-4RD CATALOG #: = Service Program STOCK ORDERING GUIDE Example: LFR-4RD-M-10L35K8-WD-DM1 / LFR-4RD-T-S / LFR-4RD-H CATALOG # FIXTURE MODULE 25L 2500 40K 4000K EMR Emergency Battery Pack with remote test switch and indicator light <sup>4</sup> 30L 3000 50K 5000K 35L 3500 40L 4000 XW Extended (65710 SC) a DALI Dimming to 1%? 2DM Lutron H-Lume 2-wire Dimming to 1% (2004 Forward Phase only)? 50L 50001 60L 60001 TRIM (Ships separately) Aperture/Shape/Function

LFR-4RD-T

4" Round Downlight Trim
Assembly

Standord
NR MQ, WQ, XW
VNR Very Narrow

NR MC MC, WG Norrow

WC Painted White
Cone and Flange

BT Black Flange

Lens Options

Lower Trim HOUSING OPTIONS (Ships separately) Aperture/Shape/Function ☐ LFR-4RD-H 4" Housing Frame, New Construction, Non-IC ☐ LFR-4RD-H-IC 4" Housing Enclosure, New Construction, IC Rated \*\*.\* Notes:

1 SGL and 6GL require marked spacing. See line at for more details.

2 DMOS, POM, DMO, DALI available up to SGL. 2DM and EDM available ISL-4GL.

3 NX requires DM driver option; will be 10L-4GL, not available with Controls, DTS, EM, EMR.

4 347V requires DM driver option; will be 10L-4GL, not available with Controls, DTS, EM, EMR.

5 CP not available with DMS, DMX, or Control.

6 Module options not available in control and control of the 10L-4GL.

8 WT not needed for WC.

9 CL lens and 8M time options not available in combination.

1 C available up to 3BL, SIA. Fedure Modules are interesting protected IC without the use of IC housing enclosure. (IC housing as this recommended when using slope iff or spray fram types).

1 C Moduling not for use in combination with Commister with Module Options CP, EM, EMR, DTS.

2 XW distribution as not available for Specular [3] reflector finals. SFL4 Soft Focus Lens and Clip, 4" Round WAL4 Wide Angle 80" Lens and Clip, 4" Round LiteGear LiteGear® Inverter, 125VA-250VA LPS Series LightPower Micro-Invertet, 20VA-55VA

currentlighting.com/prescolite

Current @

TYPE: PROJECT:

Example: VP-2-320L-145-3K7-2-R-UNV-A3-BLT

CATALOG #:

BEACON

VIPER Area/Site

MICROSTRIKE OPTICS - ORDERING GUIDE

BEACON TYPE: PROJECT: SSS-B Series Poles CATALOG #: Lighting installations for side and top mounting of luminaires with effective projected area (EPA) not exceeding maximum allowable loading of the specified pole in its installed geographic location SHAFT: One-piece straight steel with square cross section, flat sides and minimum 0.23" radius on all corners; Minimum yield of 46,000 psi (ASTM-A500, Grade B); Longitudinal weld seam to appear flush with shaft side wall; Steel base plate with axial bolt circle slots welded flush to pole shaft having minimum yield of 36,000 psi (ASTM A36) BASE COVER: Two-piece square aluminum base cover included standard HAND HOLE: Rectangular 3x5 steel hand hole frame (2.38" x 4.38" opening); Mounting provisions for grounding lug located behind gasketed cover

ANCHOR BOLTS: Four galvanized anchor bolts provided per pole with minimum yield of 55,000 psi (ASTM F1554). Galvanized hardware with two washers and two nuts per bolt for leveling Anchor bolt part numbers: 3/4 x 30 x 3 — TAB-30-M38 1 x 36 x 4 — TAB-36-M38 Durable thermoset polyester powder coat paint finish with nominal 3.0 mil thickness Decorative finish coat available in multiple standard colors; Custom colors available; RAL number preferable. SSH20-40A-4-HV-DB-RDC, SSSH25-40A-4-HV-DB-RDC and SSSH30-50B-4-HV-DB-RDC
 The HV designation in the above catalog numbers is a combination drill pattern of the Current S2 pattern and the Beacon Flat Washer
Hex Nut
Grout with drain
Optional
Level Foundation

Anchor Bolt
Hex Nut
Bolt Projection
Flat Washer
Hex Nut
Grout with drain
Optional
Level Foundation 270 90 ORDERING INFORMATION Reference page 2 for available configurations SSS -B - 25 - 40 - A/B/C - 2L - B3 - BLT - UL SERIES HEIGHT SHAFT THICKNESS MOUNTING FINISH OPTIONS 2 Two fixtures at 180° RLS Black Gloss Smooth 2 Two fixtures at 180"

2L Two fixtures at 90"

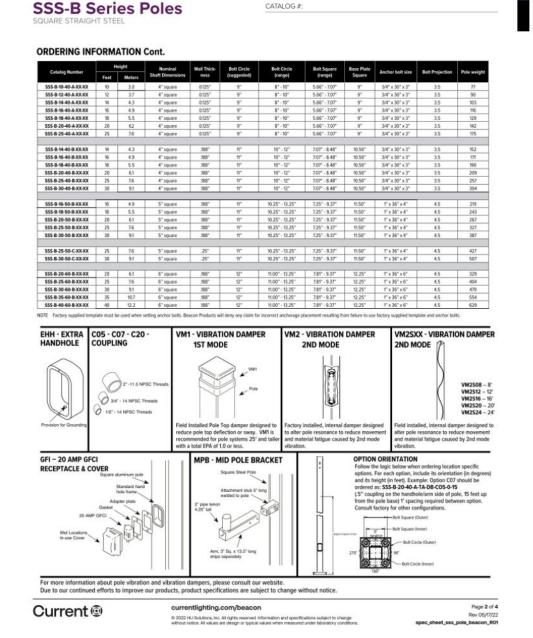
3T Three fixtures at 90"

4 Four fixtures at 90"

A Tenon (2.38" OD x4" Tall)

TB Tenon (2.88" OD WHT White Matter Fextured PSS Platinum Silver Smooth WHT White Matter Fextured PSS MATERIAN PSS Platinum Silver Smooth WHT White Matter Fextured WHT WHT White Matter Fextured WHT White Matter Fextured WHT White Matter Fextured WHT White Matter Fextured WHT WHT WHITE WHT WHITE WHITE WHT WHITE WHITE WHT WHITE W MOUNTING ORIENTATION WHT White Matte Textured VM2 2nd mode vibration damper TB Tenon (2.88" OD x 4" Tall) \*C Tenon (3.5\* OD x 6\* Tall) WHS White Gloss Smooth DRILL PATTERN B3 2 bolt (2-1/2" spacing), Viper "A" arm 52 2 bolt (3-1/2" spacing), Viper "AD" arm currentlighting.com/beacon Current @

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TYPE:

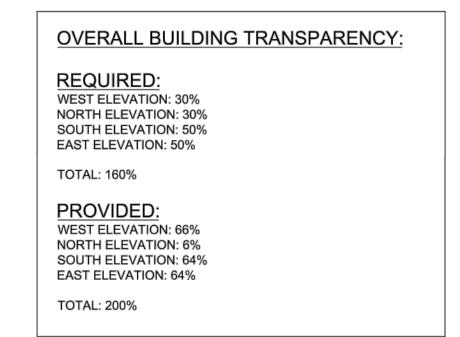
PROJECT:

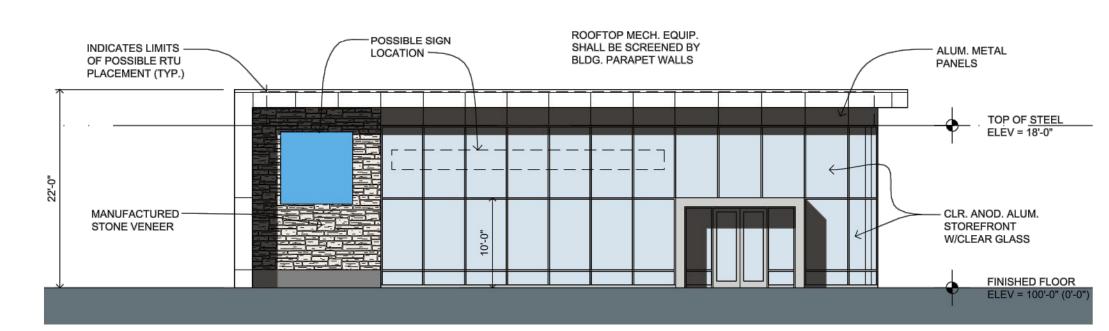
BEACON

Twp Oak Lighting ( REV2 4 field LED

Designer Date 4/5/2023 Scale Not to Scale Drawing No.

Summary



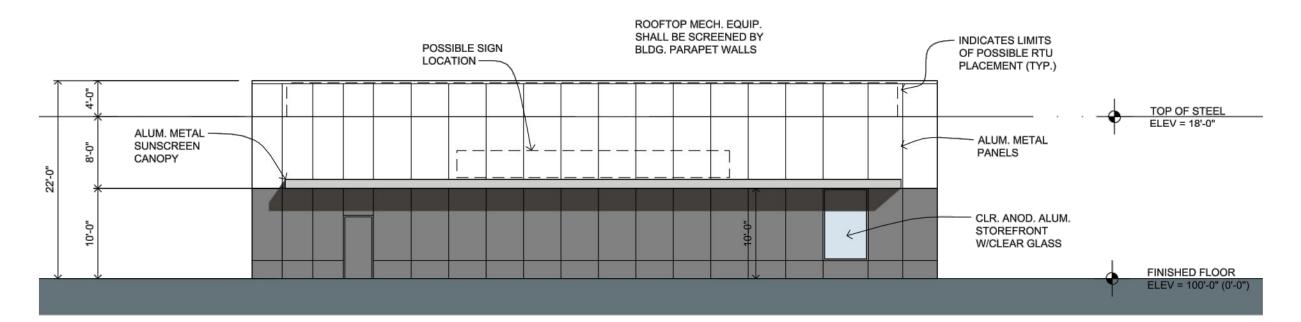


# **West Elevation**

(Parking Area)

Scale: 3/32"=1'-0"

WEST ELEVATION - FIRST FLOOR TRANSPARENCY PERCENTAGE : 30% REQUIRED 66% PROVIDED

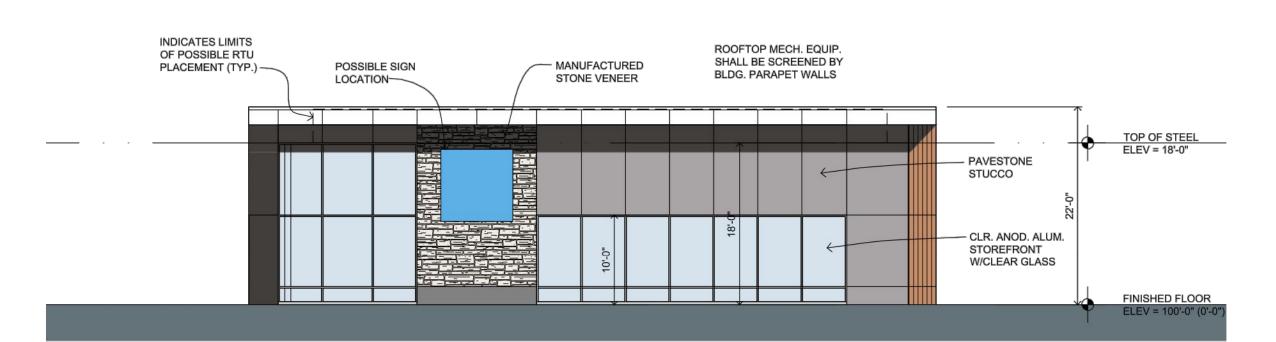


# North Elevation

(Outparcel Bldg. B)

Scale: 3/32"=1'-0"

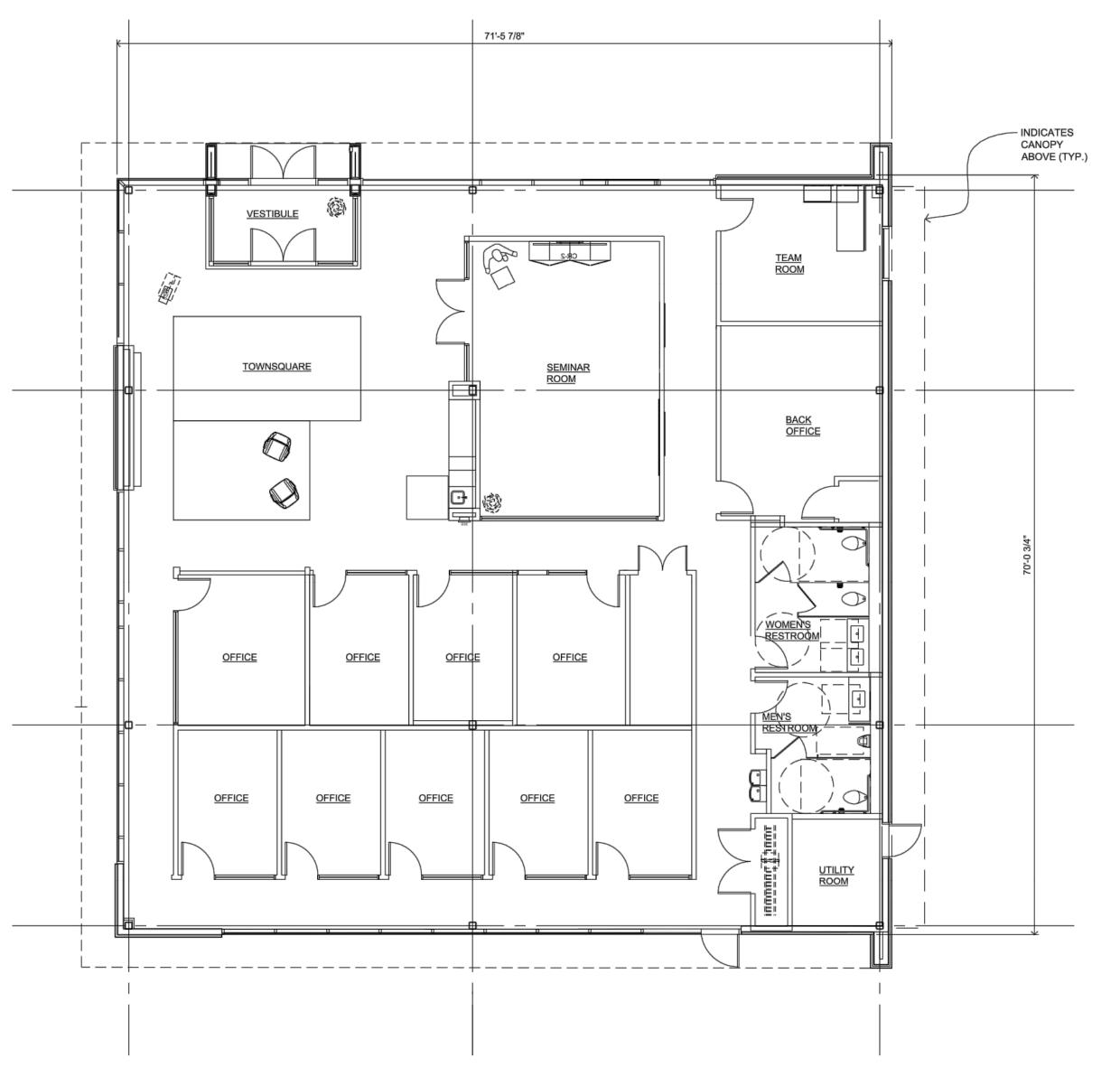
NORTH ELEVATION - FIRST FLOOR TRANSPARENCY PERCENTAGE 30% REQUIRED 6% PROVIDED



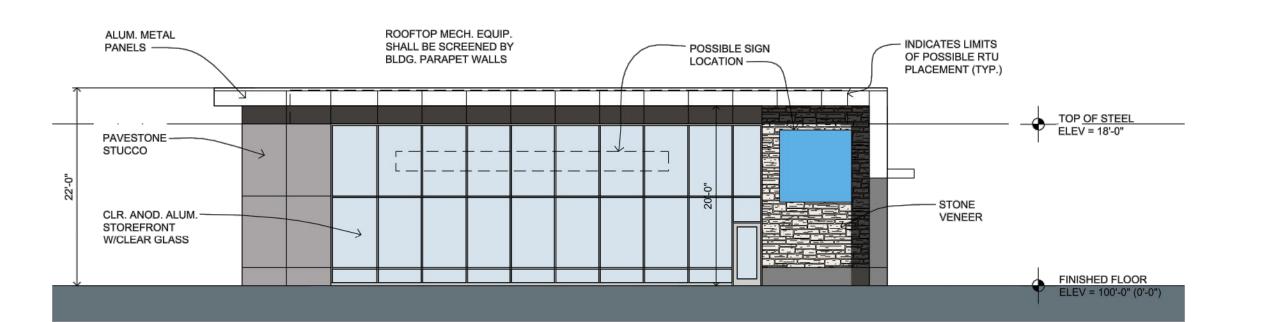
# **South Elevation**

Scale: 3/32"=1'-0" (Waters Rd.)

SOUTH ELEVATION - FIRST FLOOR TRANSPARENCY PERCENTAGE : 50% REQUIRED 64.4% PROVIDED



Floor Plan - Building A 5,005 S.F. Scale: 1/8"=1'-0"



# **East Elevation**

(Ann Arbor-Saline Rd.) Scale: 3/32"=1'-0" SOUTH ELEVATION - FIRST FLOOR TRANSPARENCY PERCENTAGE: 50% REQUIRED

64% PROVIDED

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issued for: OWNER REVIEW 01 JUN. 2021 REVISED 15 SEPT. 2021 REVISED 16 SEPT. 2021 REVISED 16 NOV. 2022 SITE PLAN REVIEW ØI DEC. 2022 OWNER REVIEW 10 FEB. 2023 OWNER REVIEW 30 MAR, 2023 OWNER REVIEW 14 JUN. 2023

project:

utparcel ak



32500 TELEGRAPH ROAD SUITE 250 BINGHAM FARMS, MICHIGAN

PH 248.540.7700 FX 248.540.2710 www.rogvoy.com



drawing:

Conceptual Bldg. Elevations & Floor Plan

DO NOT SCALE DRAWING

checked: MD approved: MD